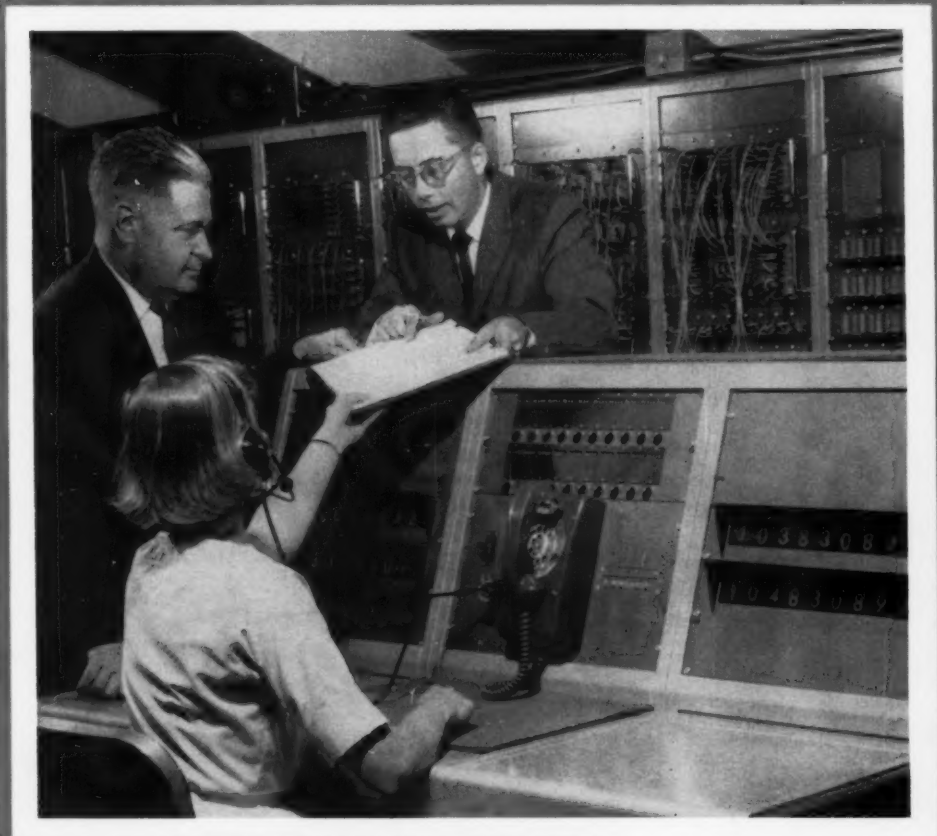
AUGUST 30, 1958
VOL. 155 — NO. 9

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY



COMPUTER SIBYL

Bell lab engineers design mechanized oracle to help predict future in communication devices and systems. Sibyl is its name. Here Engineers R. R. Riesz (left) and H. D. Irvin discuss data with Sibyl operator. **See page 37 for story.**

Published every week on Saturday by TELEPHONY PUBLISHING CORP. 600 S. Dearborn St., Chicago 5, Ill. Subscription $4.00 per year. Entered as second class matter at the Post Office at Chicago, Ill., under the act of Mar. 3, 1879.

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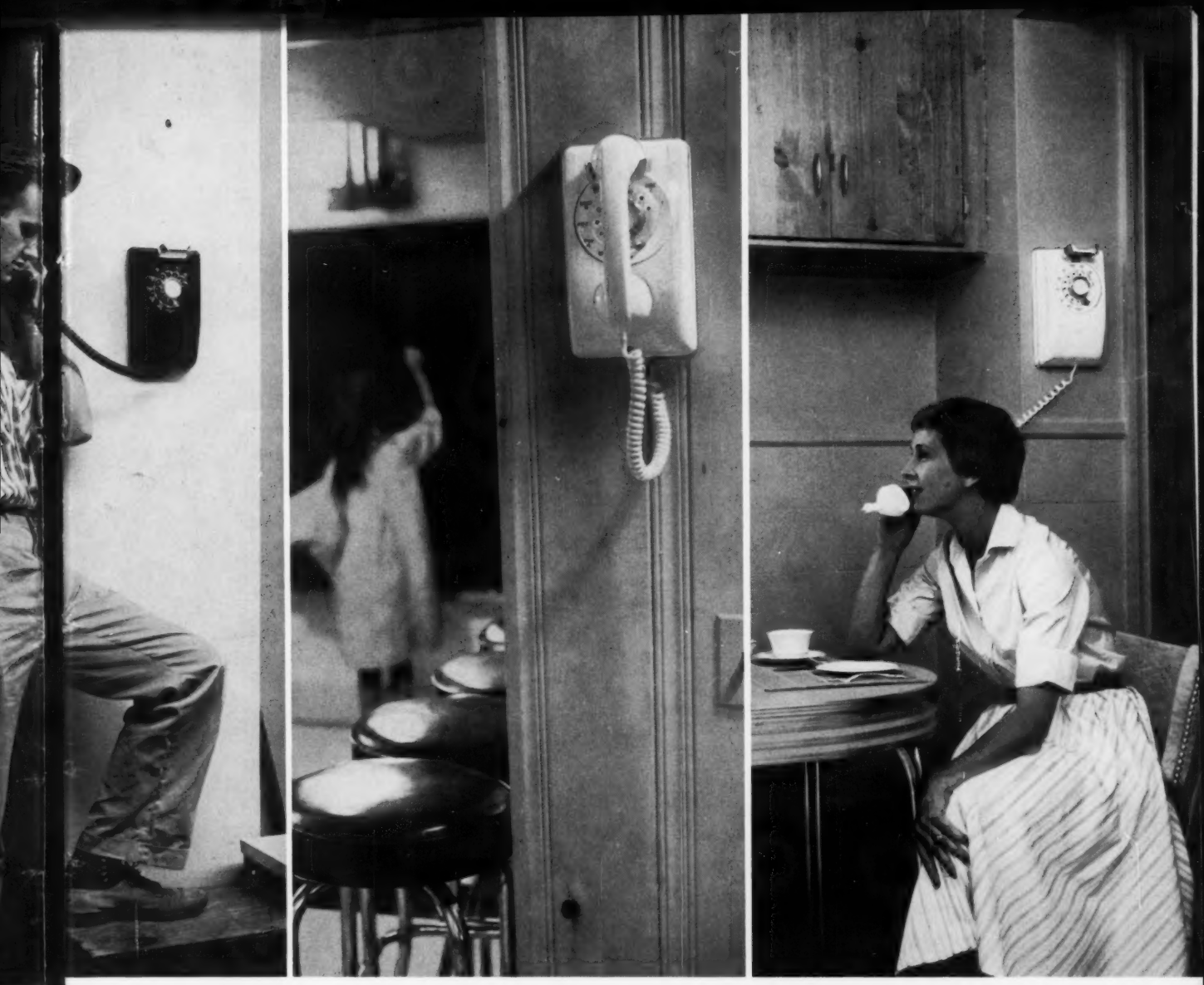
ELECTRONICS SECTION—Page 39

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

● FITS ANYWHERE...You can install the new Stromberg-Carlson 1553-W Wall Telephone anywhere -- in any number of convenient places for commercial subscribers...in kitchen, hallway, workroom, den for home users. It's an ideal extension for modern homes...perfect as a "first phone," too. Wherever you mount the 1553-W,



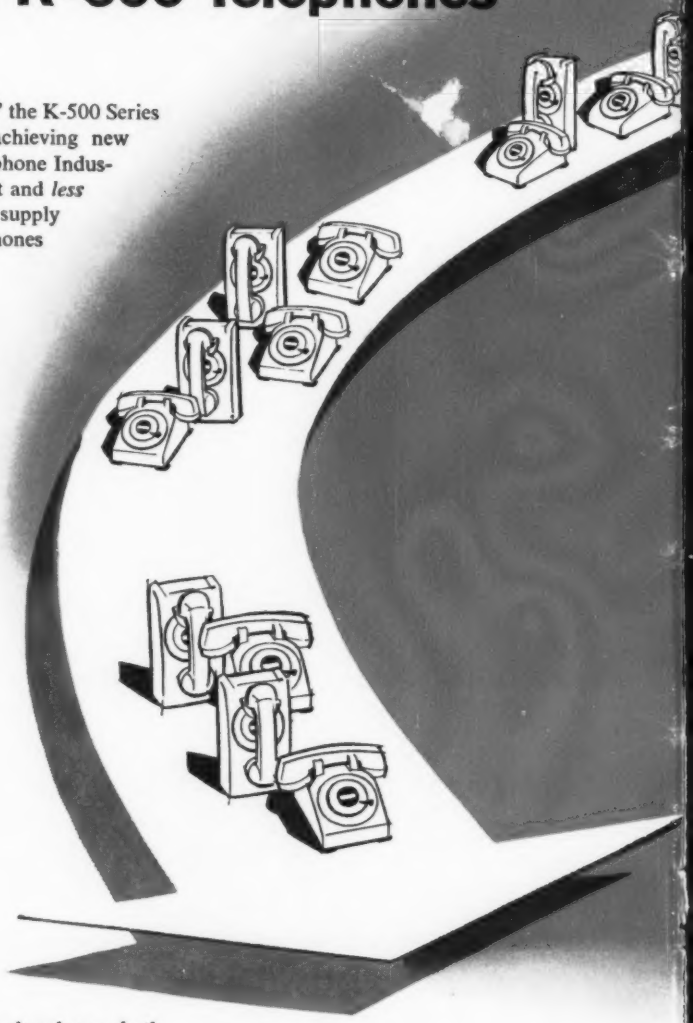
its clean modern design adds sparkling beauty. A high-efficiency "500-type" telephone, this instrument is available in ten decorator colors, including black or white. For details and ordering information see your Stromberg-Carlson representative.

STROMBERG-CARLSON A DIVISION OF GENERAL DYNAMICS CORPORATION

ELECTRONIC AND COMMUNICATION PRODUCTS FOR HOME, INDUSTRY AND DEFENSE

Kellogg's Monthly Shipment

for Pace-Setting K-500 Telephones



Called "the ultimate in telephone engineering," the K-500 Series continues Kellogg's outstanding record of achieving new performance heights for the Independent Telephone Industry. And now it will be easier, more convenient and *less expensive than ever* for you to assure a steady supply of these often-imitated, never-equalled telephones for your growing subscriber needs.

HERE'S HOW THE PLAN WORKS:

Place your order now for your yearly telephone requirements with your nearest Kellogg warehouse. Each month, the number and type of telephones you require will be shipped to you. It's as simple as that.

HERE ARE THE PLAN'S ADVANTAGES:

You get the lowest price per phone, based on your *yearly* quantity order. You're assured fast on-time deliveries, via best possible methods, from your nearest Kellogg warehouse. You're freed from storage and inventory problems—record keeping and warehouse costs are minimized.

This monthly shipment plan applies to both the K-500 Series desk telephones and new K-544 wall phones. Technically, these are the most advanced instruments Kellogg has ever produced, setting new performance standards for the Independent Telephone Industry. And to meet ever-growing subscriber demands for *color* phones, both models are available in 15 bright new decorator colors!

Many companies are availing themselves of this plan. To place your order, or for more information, see your local Kellogg sales representative or the nearest Kellogg branch warehouse listed below.

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Ill.
Communications Division of International Telephone and Telegraph Corporation.

Plan

15 Bright Colors!

BLACK • RED • YELLOW • GREEN • BLUE • BEIGE • GRAY
BROWN • IVORY • TURQUOISE • ROSE PINK • AQUA BLUE
LIGHT BEIGE • LIGHT GRAY • WHITE

Demonstrate how the handset of the K-554 can be hung on the side without breaking the circuit!

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CHICAGO, ILLINOIS
Communications Division of ITT

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Minneapolis 16, Minn.
West 9-6715
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Passaic, New Jersey
PRescott 9-3610
TWX PAS 1067

OHIO
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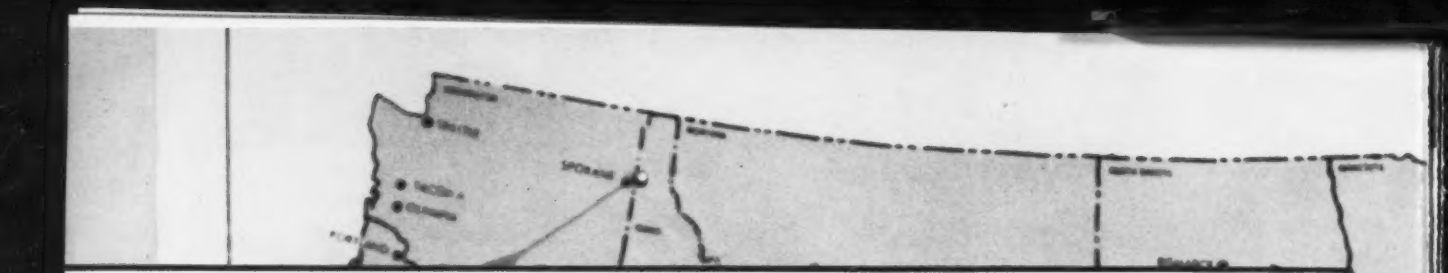


Long Distance...

Far-reaching Servant of the Nation's Business

For years businessmen have been told through advertising about the value of Long Distance telephoning. That's because so much out-of-town business can be conducted by telephone. Products can be sold, for example, and orders taken, appointments made, shipments checked, overdue accounts collected.

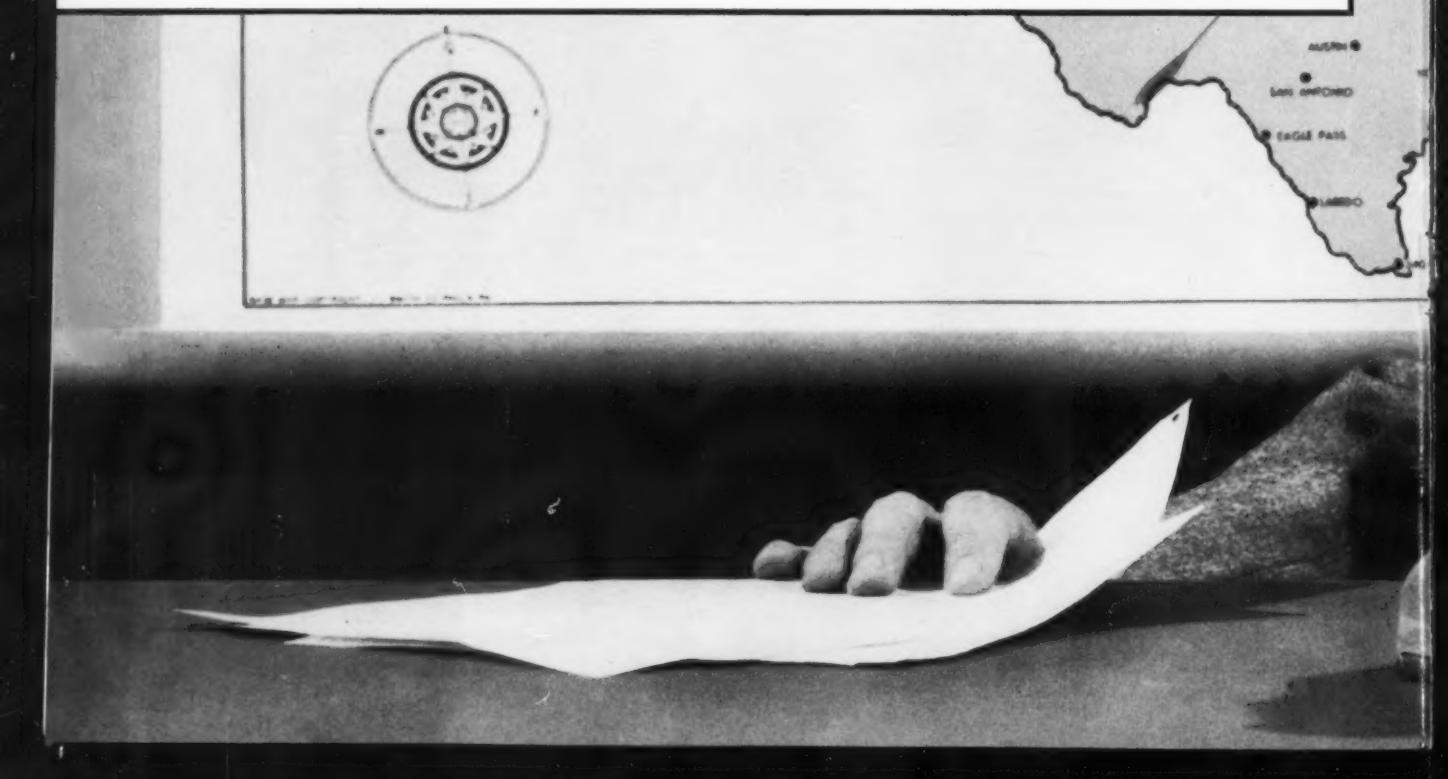
Advertising is also helping to open new markets for Long Distance usage . . . urging florists to telephone their out-of-town orders . . . and hotel and motel owners to call ahead for reservations on behalf of their guests.

Every year more and more Long Distance calls are made for business reasons, and that increases revenues for all of America's telephone companies. The more valuable we make the telephone to businessmen, the better off our own business is!

Bell System advertising is continuing to sell the value of Long Distance in such widely read business publications as

Time • Newsweek • U. S. News & World Report • Business Week
Nation's Business • Dun's Review and Modern Industry • Forbes • Credit and Financial Management

BELL TELEPHONE SYSTEM



DULUTH
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MILWAUKEE
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FORT SMITH
LITTLE ROCK
VICKSBURG
JACKSON
BATON ROUGE
GALVESTON
BURLINGTON
CONCORD
BOSTON

FLASHES AND PLUGS

SPECIAL EFFECTS. Ron Bishop of Santa Monica, Cal., called our attention to the fact that husbands have to be very careful when using drive-in telephones.

It seems that out in Hollywood, Cal., Milo Frank left work at Metro-Goldwyn-Mayer late and, seeing a new drive-in telephone, decided to try out the new gadget as well as let his wife, actress Sally Forrest, know that he'd be late for dinner.

He won't do it again; that is, at least not with his car radio providing background music.

Mrs. Frank said it might have been the car radio, but it sounded like a juke box at the corner bar—or so said the publicity releases.

•

LIGHT UP THE FLOOR! A frustrated subscriber recently called his telephone company's business office to suggest that the company re-design its telephone booths.

The unusual complaint was that the booth's designer didn't take into consideration the possibility of one missing the slot and dropping a coin on the booth floor at night.

"The light has to be on so I can find the dime," the customer explained. "But the light won't go on unless the door is closed. And if the door is closed, I can't bend over."

•

JUMPING THE GUN. City Editor Max Stokesberry of the *Ponca City (Okla.) News* was asked on the telephone if he had seen a story about the funeral of so-and-so.

"No," he answered.

"Well," said the caller, "that's all right. I've just been out of town awhile and wondered if so-and-so had died."

•

MOST LIKELY TO SUCCEED. When the Southern Bell Telephone & Telegraph Co. recently cleaned out its library, one of the books discarded was a 925-page tome entitled "The American Technical Society Telephony."

The library card in the back showed the book had been taken out just once, 27 years ago by a young college trainee named Ben S. Gilmer.

Mr. Gilmer now is president of Southern Bell.

•

TOUCHÉ! Pat: "Your nose is suspiciously rosy this morning. What could it be now that makes it so red?"

Mike: "Sure 'tis the reflection of me soul, blushing with pride at me ability to mind me own business."

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

August 30, 1958

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another **FIRST** by Lorain!

THE S-5 SUB-CYCLE

FOR SYNCHROMONIC RINGING!

PERMANENT

Dependable

OPERATION!

YEAR AFTER YEAR

Making use of a unique conversion principle combined with basic Sub-Cycle circuits used repeatedly in other Lorain equipment, the S-5 Sub-Cycle has power to spare. Depend upon it to deliver full-rated capacity even under the most gruelling conditions. It has excellent voltage regulation, and will always deliver the exact synchromonic ringing frequencies. The S-5 has no moving parts; therefore, it provides the permanent, maintenance-free, economical operation that is characteristic of all Sub-Cycles.

The Model S-5 can be equipped to supply either 15 cycles or 20 cycles as the fifth frequency; if only four frequencies are required, the converter is designated as a Model S-4. A minimum of floor space, only 24-3/8" by 15", is required.

WRITE FOR BULLETIN 169

SOLD BY ALL LEADING TELEPHONE DISTRIBUTORS

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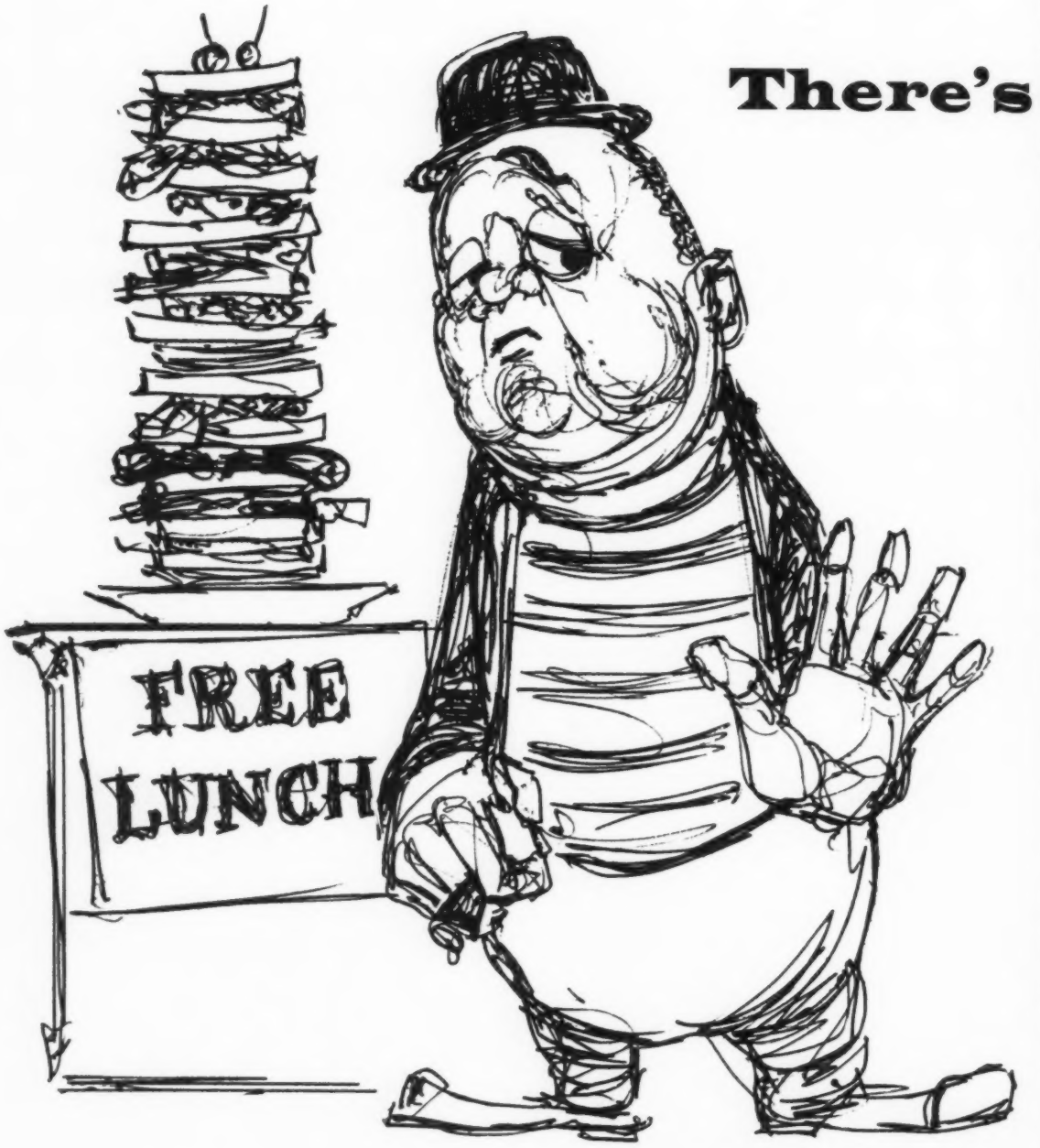
PARTNERS IN DEPENDABILITY
SUB-CYCLE

LORAIN PRODUCTS CORPORATION · LORAIN, OHIO



LEICH

Subsidiary of GENERAL TELEPHONE

No Such Thing As...

Everybody who thinks about it realizes that the wily proprietor of Joe's tavern is not running a charitable institution. His free lunch will be paid for somehow . . . by someone other than Joe.

You can apply this free lunch type of thinking to the telephone business too. When you receive an absurdly low quotation on telephone supplies . . . you might ask yourself . . . what is this company planning for the future of my company? Or . . . for the future of the whole telephone industry?

We must—here at Leich—offer fair and competitive prices to continue in business. Just as important, we must make a profit. For part of every penny we earn goes back into our (and your) business in the form of research, product development, improvements in facilities and personnel.

Only by putting part of what we make back into our business, can we build a strong, dependable company that will help you do your job more efficiently and profitably.

We're at your service. If . . . five years from now . . . you wish to complain about something you bought yesterday . . . we will *still* be at your service.

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

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manufacturers of telephones, switchboards and related apparatus since 1907

GO MODERN on Your Party Lines!

Install...

*UNIVERSAL RINGING CONVERTER**

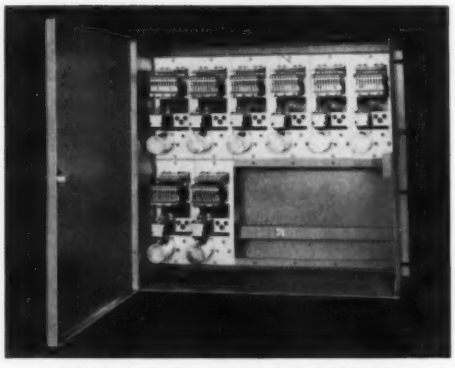
on Your Present Equipment

A simple applique circuit which places the wiring modification on a factory basis... most installations can be performed by maintenance personnel.

Other ***UNIVERSAL*** Equipment:

DIGIT ABSORBER
COMPUTER INTERCEPT
TRUNK DIGIT REGISTER

Modern Service Demands Selective Ringing!



Typical relay case for Ringing Converter. Case requires 17″ on a 19″ relay rack. Capacity 12 units.

* Pat. Pend.

FOR FULL PARTICULARS
PLEASE WRITE DIRECT TO
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OR CONSULT YOUR DISTRIBUTOR
FOR DETAILS

TELEPHONE DIVISION

UNIVERSAL
CONTROLS CORPORATION
OFFICE AND PLANT – CARROLLTON, TEXAS
MAIL ADDRESS – P. O. BOX 13122, DALLAS 20, TEXAS
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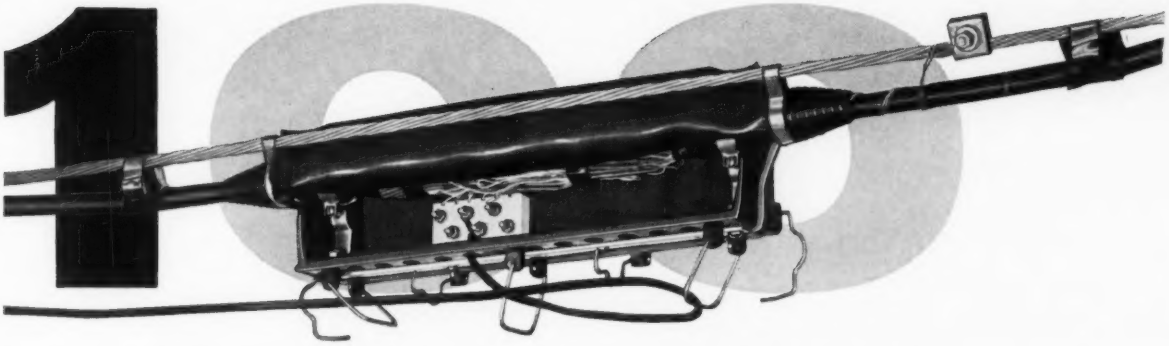
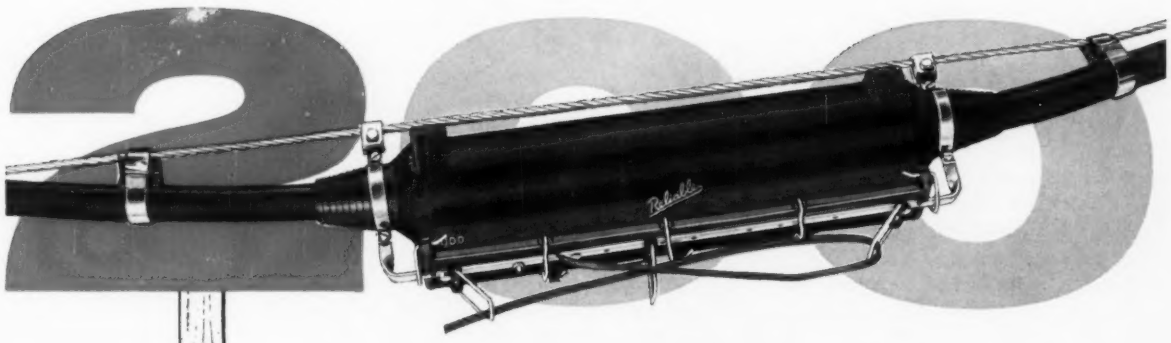
ON ORDERS DIRECT TO **UNIVERSAL**, BILLING WILL BE THRU YOUR PREFERRED DISTRIBUTOR.



Reliable ready-access terminals . . .



now in **two** sizes for cables up to 2.2″ in diameter

Reliable now offers Ready-Access Cable Terminals in two sizes for use with plastic jacketed, plastic insulated cables.

Catalog Series 100 – for cable up to 1.2″ O.D.

Catalog Series 200 – for cable from 1.0″ to 2.2″ O.D.

Catalog Series 100 and 200 units are easily installed and easily maintained terminal and splicing facilities. Up to four 6-pair Reliable Catalog No. 105 Terminal Blocks can be added to both Series Terminals, or the space can be used for loading coils. The flexible neoprene cover is conveniently folded back, as in upper illustration, while internal wiring is altered to meet changing requirements.

You will get interesting details by writing for Product Data Sheet No. 17, featuring Ready-Access Cable Terminals.

Reliable ELECTRIC COMPANY • FRANKLIN PARK, ILLINOIS

A HALF CENTURY OF SERVICE TO THE UTILITIES

GET READY . . . GET SET . . . GO!

October 12-13-14-15

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Of The

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INDEPENDENT TELEPHONE ASSOCIATION

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Register Now With The

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION

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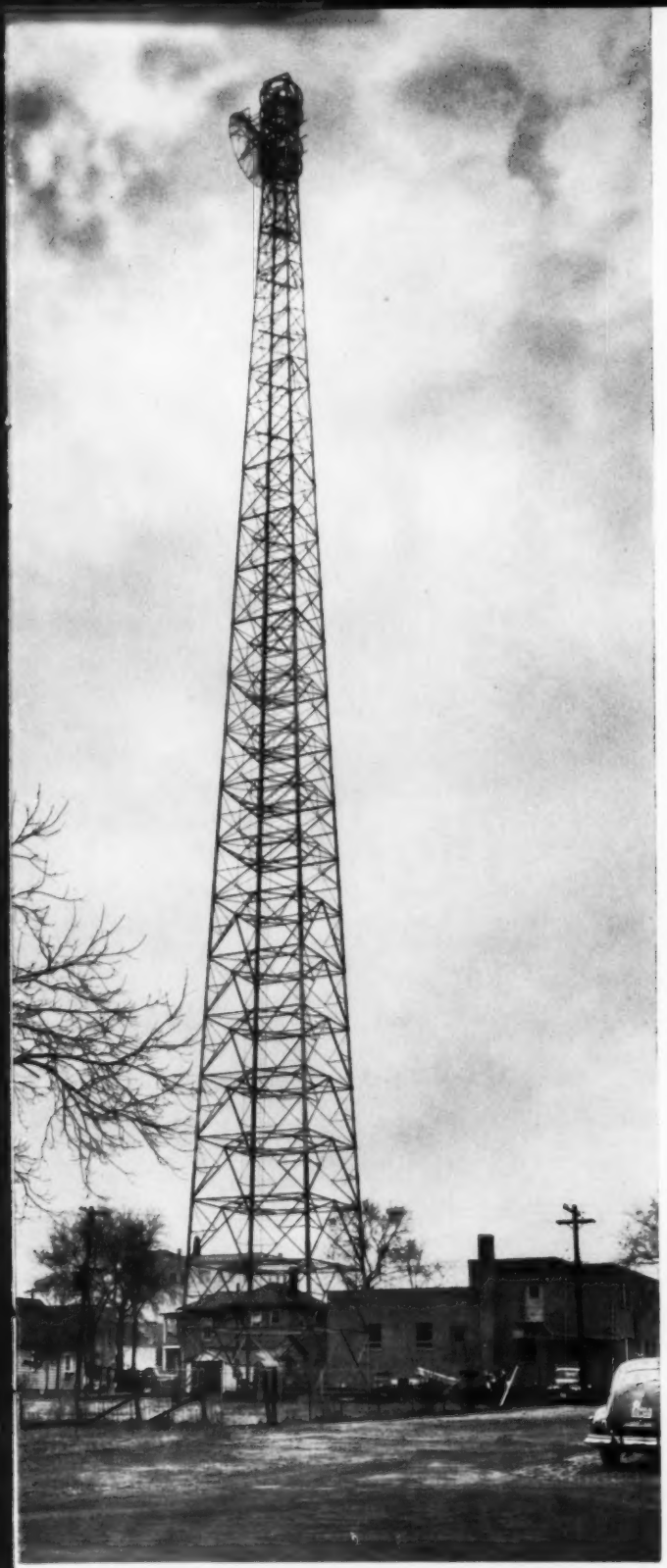


This 300 foot self-supporting tower, located at the rear of new central office building, requires minimum space. Tower design meets rigid standards for safety, wind loading and quality of construction.

Signalling between Marion and Harrisburg this dish is mounted for 360 degree orientation . . . is easily positioned for any future change in signal path. Ring mounts will also simplify installation of additional antennas as the system grows.

at Marion, Illinois . . .

General Telephone goes microwave with a Blaw-Knox tower

In extending their toll system and converting to customer intertoll dial operation, General Telephone of Illinois chooses microwave as the cost cutting answer to today's needs, tomorrow's expansion.

Like so many companies in the General Telephone system turning to microwave, they chose a Blaw-Knox tower. And Blaw-Knox, for over 40 years, has been building towers that keep pace with the future. This tower, like all Blaw-Knox towers for communications, is tailored to *established* specifications, built to *individual* needs.

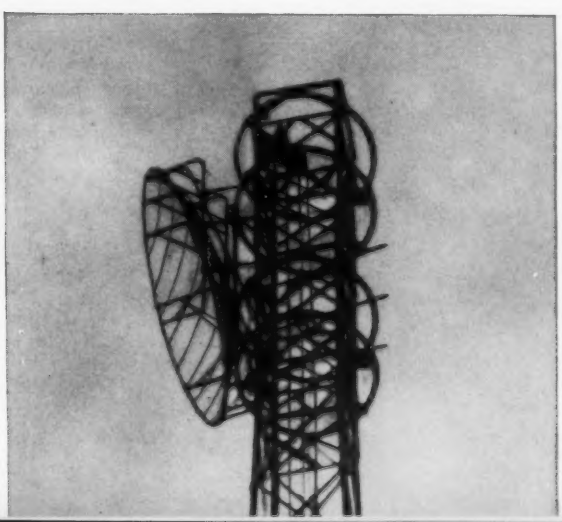
Blaw-Knox's Microwave Tower Booklet covers the unique advantages of microwave service, and outlines a complete service that ranges from tower design through fabrication and erection. Write for Booklet 2538.

Microwave Towers—guyed and self-supporting towers for microwave, AM, FM, TV, radar and communications . . . transmission towers . . . parabolic antennas . . . special structures.

BLAW-KNOX COMPANY

Equipment Division · Pittsburgh 38, Pennsylvania

BLAW-KNOX



UNITED TELEPHONE COMPANY OF INDIANA, INC., SPECIFIES *ANOTHER* C&D BATTERY INSTALLATION

Chief Engineer R. E. Daniel of United Telephone Co., Warsaw, Ind., left, discusses latest installation of C&D telephone batteries with C&D District Representative Arnold McPhee.

Why is second-largest independent telephone operating system in U.S. sold on C&D?

This C&D installation at the new Warsaw, Ind., exchange of United Telephone Company marks another location for C&D batteries in the nation's second-largest independent telephone system.

Why C&D? When queried, a United Telephone Company spokesman summed it up this way—

. . . good performance, good delivery, good service, and competitive price.

. . . all the advantages C&D batteries have to offer were *as presented* by the C&D sales and service representative when the company was first contacted about using C&D batteries. United Telephone Company, he adds, has found no discrepancies in the story.

. . . periodic checks and inspections from the manufacturer help the customer with his routine operation.

United Telephone Company is sold on the performance of C&D batteries to do the heavier-duty work for dial systems, for C&D supplies "engineered power" for telephone industry growth.

In addition to the big, rugged hard-rubber jars, C&D supplies (and pioneered) rugged, one-piece clear plastic cases—lightweight, shock-resistant, heat-resistant, and hermetically sealed.

PlastiCal® (lead-calcium) batteries—compact modern design for full-float telephone service—provide dependable standby power for *25 years*. By reducing the number of over-charges per year, thus eliminating much of the voluminous record-keeping, the *PlastiCal* battery provides substantial savings.

For growing telephone exchanges, the C&D PlastiCell (lead-antimony) battery provides full .266″ positive plates, triple insulation, and 14 years of life in full float service.

And, as an added feature, *PlastiCal* and *PlastiCell* batteries both give you the Saftee-Vent, which prevents accidental internal cell explosions and serves as a convenient funnel for filling or testing.

Next time you specify—specify C&D. Ask your nearby C&D representative . . . or your telephone equipment supplier.

Bulletins T-532 & T-533 carry full details. Why not send for copies for your file?

C&D BATTERIES, INC.
of Conshohocken, Pa. ... Attica, Ind.

Since 1906

Sales and Service Offices in Principal Cities from Coast to Coast

Manufacturers of Spun-Cad® Industrial Batteries • PLASTICELL and PLASICAL® Batteries for Communications, Control and Auxiliary Power • Producers of Autofloat* Silicon Rectifier Chargers
*T.M.

Buried Wire and Cable Construction

By RAY BLAIN

Part 2

IN THE Apr. 28, 1956 issue of TELEPHONY, we published an article on the plowing in of buried wire and cable, authored by M. J. Luichinger, presently general staff coordinator for the Indiana Bell Telephone Co. We are now informed by Mr. Luichinger that, except for a few minor changes in the over-all practice of managing this class of work, the general methods and type of plow are essentially the same as the plow covered in the above-mentioned article, which was developed by Massey-Harris-Ferguson. He states further: "Since the time my article was published, we have placed many miles of small sized cable and wire in small exchange and rural areas, and it is working out very satisfactorily."

Illinois Bell Approves

We learned that C. H. Elder, outside plant engineer of the state area of the Illinois Bell Telephone Co., has had considerable experience with buried wire and cable so we asked him for a report. He furnished us the following interesting information:

"During 1957 we rebuilt five exchanges varying in sizes from 145 to 609 main stations. Practically all of the rural plant was rebuilt with a buried facility and included over one million linear feet of small sized cables and about 900,000 feet of 'B' underground wire.

"The services to the houses were placed in the most economical manner using an aerial drop from an existing pole, or plowing directly to the house, depending upon the particular conditions.

"An International 400 tractor, equipped with quick-hitch and front end loader modified for carrying a reel, was used as the motive power throughout. The plow was a standard 24-inch subsoiler, onto which a feeding tube had been welded.

"The construction force consisted of a lineman operating the tractor, one lineman assisting with the handling of the reels of wire and cable, a two-man line crew following up with the terminating and clean-up work, and a trencher operator to cut the trenches over to the pedestals, developed by Utility Products Co. of Milwaukee, Wis., or poles where the terminals were placed.

"Public right-of-way was used entirely with most of the plowing being done in the road shoulder at depths varying between 18 to 22 inches. Complete costs including material, labor, overhead, etc., averaged out as follows:

'B' Underground wire per linear foot	$ .118
Six-pair polyethylene-insulated cable per linear foot—	.208
11-pair polyethylene-insulated cable per linear foot—	.215
16-pair polyethylene-insulated cable per linear foot—	.290
26-pair polyethylene-insulated cable per linear foot—	.425
51-pair polyethylene-insulated cable per linear foot—	.451
76-pair polyethylene-insulated cable per linear foot—	.638

"Most of the cable placed contained 19-gauge conductors. Cables larger than the above require larger plows and more drawbar power than can be obtained with the rubber tire type of tractor. Consequently, we have used a Ryan plow pulled by crawler type tractors for the larger cables.

"We are of the opinion, based upon our experience to date, that buried rural plant can be placed at considerably less cost than aerial and that the maintenance will be only a fraction of that experienced on present overhead plant.

"Our experience with trouble on buried plant, so far, would indicate that once the new installation troubles are clear, the plant remains practically 'trouble free.'

"We have used the 'B' underground wire exclusively because we are of the opinion that the metal wrapping is necessary for protection against termites, gophers and ground freezing.

"Polyethylene-insulated cable has been used exclusively for rural distribution plant.

"Our program for 1958 will be between three and four times greater than in 1957. We are building no new open wire lines and, except in isolated conditions, we will dismantle open wire plant whenever it can be done without too great an economic penalty.

"We are making several large installations of buried urban plant, among which are Elk Grove, 6,000 lots; Winter Park Northwest, 3,000 lots; Trout Valley, 600 lots, and Plum Grove Estates, 600 lots. Altogether over 12,000 lots are scheduled for complete telephone and power buried plant.

"Experience so far indicates sizable savings over the aerial plant that would be required. Most of the streets are winding and anchoring would be a terrific problem. We are using mostly rear lot line 10 foot wide easements with pedestals at every other lot line, and burying the service wire (always two pair) perpendicularly from the cable trench to the house."

Indiana Independent

The Princeton (Ind.) Telephone Co. has had considerable recent experience in the installation of buried wire and cable. Herbert E. Jones, plant engineer, has been kind enough to furnish us with the following report on this company's installation.

The Princeton company originally purchased a utility size John Deere tractor equipped with weighted wheels and 14-inch tires for use in pulling the plow used in buried wire construction. This tractor was, however, soon replaced by a John Deere 30-h.p. small versatile crawler because of the slippage of the rubber tires on gravel roads.

To get started they modified a sub-

"Nation's Capital" Will Return Sept. 13

There will be no "In the Nation's Capital," by Francis X. Welch in this issue as Mr. Welch is attending a meeting of the American Bar Association (ABA) in Los Angeles. Mr. Welch is secretary of the Public Utility Section of the ABA. He will resume his regular column in the Sept. 13 issue of TELEPHONY.

soiler by equipping it with a tube to carry the wire underground. This plow was later replaced with one designed by Hallenberger, Inc., of Evansville, Indiana. The new plow is somewhat heavier and can be more easily controlled. The sub-soiler had a tendency to lean to one side.

A frame was designed to run the wire up over the crawler and down into the plow tube. The wire is first payed out on the ground, from a truck ahead of the crawler. The standard three-point hitch and hydraulic system on the crawler is used and flasher lights are added for safety. License plates were also purchased for both the tractor and crawler. The rubber tired tractor is used to follow the plow and close the opening. Two passes of the tractor are normally required to make this closure. This tractor is also used to pull a small drag to finish and smooth out the cut made by the plow.

This company plowed in Superior 17-2 direct burial wire 20 inches deep. Two wires are buried in one operation when two circuits are required. If three or more circuits are required they place plastic cable. The cost of three wires almost equalled the cost of six-pair plastic cable. When cable was buried they used aerial or duct type. It is admitted that this type of cable provides very little mechanical protection. To date, however, they have experienced very little trouble. Time will indicate whether additional protection is required in this particular section of the country.

Plowing was located at the grass line along gravel roads and at the right-of-way line along state roads. The county would not grant permission to plow along blacktop roads because of the narrow berm in most cases. Regular permits were obtained from the state for all poles and a $5.00 fee paid for inspection of buried-runs along state roads.

Ordinary steel fence posts were used for riser poles. A suitable plate was welded over the channel to protect the wire or cable from grass fires. Regular two-binding post terminals or six-pair plastic cable terminals were mounted on top of the fence posts. None of the splices were made underground. When a reel ran out, the wire was extended to the right-of-way line and placed on a riser for splicing. This arrangement also provides convenient test points for use in shooting trouble.

Bridges were crossed in numerous ways depending on location, construction, etc. A wide, deep ditch was usually crossed by setting poles and spanning it aerially. Iron pipe was attached to some bridges and the wire pulled through. Shallow ditches, where the plow could operate, were plowed through. Culverts, if deep enough, were plowed over, and iron pipe was installed over others.

Several drops were plowed in direct to houses. The customer usually prefers this type of installation to aerial drop wires. Due to the increased cost, however, an additional charge should be made for underground drop installations. When an underground service was provided, a fence post and terminal were placed at the road. The rubber-tired tractor was used to avoid cutting the lawn with the crawler tracks. A half-inch conduit with a 90 degree bend at the bottom and a weather head on the top was placed on the house. The regular station protector was used at the house. As previously indicated, this practice proves expensive because of the time required to work around shrubbery, etc., and to make a neat installation.

For cost-estimating purposes, the Princeton company has determined that a three-man crew will average one mile of buried wire per day. On some days, however, it will bury two or three miles, and on others only one-half mile. They estimate the in-place cost to average $200 per mile for labor and equipment. The material will average $350 per mile for one pair of wire. Maintenance to date has been extremely low, consisting mostly of grounds at protectors. In two or three cases, the wire has been damaged by digging operations on construction work. The company is also of the opinion that public relations have been greatly improved as a result of the few service interruptions and the absence of unsightly wires and poles near customers' property. The company is completely satisfied with their buried plant and are planning and laying out more of this type of construction daily.

Ryan combination reel trailer and cable layer being used as a cable layer. It can lay two cables at one time.

Southern Bell Boosters

During the Signal Corps Engineering Laboratories' Sixth Annual Wire and Cable Symposium, held last December, John W. Davis, assistant vice president of the Southern Bell Tel. & Tel. Co., presented a paper, co-authored by D. G. Wilson, engineer, and A. C. Benner, construction methods engineer, of Southern Bell, titled: "Buried Rural Telephone Distribution Systems." He stated that after a tremendous postwar expansion program, Southern Bell was still faced with the problem of providing service to thousands of rural customers living in areas where conventional construction methods entailed severe cost penalties. For many years the potential economy of buried plant had been recognized by this company, but early efforts were abandoned because of materials that were not entirely satisfactory and inadequate installation procedures.

Then this company concluded that reasonable material and plowing costs might be expected and a decision was made to proceed with a buried distribution program even though a great deal of development work would be required in the evolution of construction techniques.

Accordingly, in August, 1954, the Mississippi division of Southern Bell purchased a WC-20 system standard wire and cable plow to be used in cable and wire laying operations. This plow was capable of laying cable or underground wire to a depth of 20 inches and required a D-6 Caterpillar tractor, or equivalent, as a prime mover.

Beginning in September, 1954, about 25 miles of one-pair underground wire and 4 miles of 11-pair, 19-gauge, PIC cable were buried. The tractor, operator, and labor for required hand-trenching were all supplied by the contractor. The telephone company's personnel comprised a foreman, two linemen, and two cable splicers when cable was involved. Cable termination at distribution points employed a six-pair terminal previously used in six-

The above photos were furnished by Princeton (Ind.) Telephone Co. UPPER LEFT: Plowing in cable from right-of-way line terminal pole. UPPER RIGHT: Pulling slack for terminal and pedestal installation. RIGHT: Plowing in wire along edge of gravel road.

pair wire construction, but modified on the job to accommodate PIC cable. Joining conductors at reel-ends was performed in the trench with conventional splicing techniques. A 104 copper shield wire was buried with the initial cable as a conservative measure to afford lightning protection.

From these early efforts it became apparent that more efficient plows and less costly terminating facilities were required to place buried plant at an initial cost competitive with that of comparable aerial plant. Moreover, it was concluded that, because of the high dielectric strength of solid polyethylene, the shield wire could be safely eliminated in all except high earth resistivity areas, thus effecting an appreciable cost reduction.

In the interest of obtaining reduced contractor plowing costs, Southern Bell engaged with Frank Horton & Co., of Lamar, Mo., who had under development excellent plowing equipment operated by well trained crews. This contractor proposed to lay cable to a depth of 18 inches to 24 inches, and to restore the earth's surface for prices in the order of 5¼ cents per foot. Wire would be placed at a depth of 14 inches to 18 inches for 4½ cents per foot. These prices were predicted on a volume of at least 400 miles, available at 80 miles per month, or more. Hand digging was excluded from the contract, and an additional fee of $1.00 per mile was included for job moves greater than 150 miles.

These contract prices were sufficiently low to make the prospective cost of buried facilities favorable where an extensive coordinated rural program was practicable. Still to be resolved, however, was the problem of suitable terminating facilities. Here, the Bell Telephone Laboratories came to the rescue with a "drawing board" design of a six-pair terminal for buried cable distribution. The terminal was to be composed of piece parts taken from standard apparatus, i.e., a weatherproof apparatus box used for a variety of purposes, a terminal strip used for terminating six-pair drop wire, and other small piece parts. This terminal could be mounted on a post or a pole, the choice depending on the service entrance, whether buried or aerial. Its design permitted looping the cable, with the sheath removed, through the terminal, thus providing access to all pairs. This feature also permitted joining the conductors of six-pair cables at reel-ends by termination, a measure considered advantageous from a cost aspect.

One job handled by Southern Bell in Louisiana consisted of six miles of PIC cable in sizes from 6 to 51 pairs placed 20 inches deep in the roadway of a gravelled, clay base state highway. At terminal locations, the plow share was raised momentarily while a loop of cable was pulled to the terminal location at the edge of the right-of-way. After the plow's passing, the loop was hand or machine-trenched 36 inches deep across the road shoulder to the terminal location. A similar procedure was employed at obstructions such as small bridges and culverts where loops were hand-trenched around, and under the obstructions. Thus, the plow train proceeded with minimum interruptions, and splicing time was saved at the expense of some excess cable. The use of the terminals for terminating, loading, and splicing appeared entirely satisfactory, and an expansion of the techniques to larger cables was immediately contemplated.

As a result of this trial, the joining of conductors at reel-ends on terminal strips was looked upon with increasing favor since the method (1) eliminated the need for skilled cable splicers on the job, (2) provided an accessible full-count test point, and (3) provided a distribution terminal. Moreover, at the

time there was no entirely satisfactory method of completely retaining the integrity of conductors at splices. This was a fairly important consideration since no effort was made to prevent moisture from entering the cable at the terminals. For these reasons, it was decided to join, at reel-ends, the conductors of all cables containing up to 51 pairs by the terminating method.

The Louisiana trial installation served to prove in the new materials to a large extent and to solidify thinking on construction techniques. Since the cost of buried plant compared favorably with that of equivalent aerial plant, the decision was made to employ buried cable and wire in Southern Bell territory, whenever practicable, to expand rural telephone service. During 1955, more than 11,500 rural subscribers in Southern Bell territory who could not otherwise have been accommodated economically received telephone service from buried wire and cable. To accomplish this required some 1,700 miles of buried cable and 1,300 miles of buried wire, more than 75 per cent of which was placed in the state of Louisiana. During 1956, and the first six months of 1957, an additional 3,400 miles of buried rural cable and 1,100 miles of buried wire were placed in service by Southern Bell.

The philosophy of buried facilities substitution for aerial plant enjoyed increasing popularity. While this was primarily the result of lower initial cost, it was also becoming increasingly apparent that lower maintenance costs and fewer service failures were being obtained. Nearly all failures were of a mechanical nature resulting largely from plowing operations or subsequent excavation by foreign workmen.

Southern Bell's use of buried PIC cable and underground wire for rural distribution plant is now well into the third year. Analyses indicate that "in plant" cost is from 15 per cent to 30 per cent less than that of equivalent aerial plant, exclusive of pole line costs.

Furthermore, plowing has been found feasible in much more difficult terrain than was originally thought possible, and the trouble incidence is very low.

One problem at least remains—so states the Southern Bell engineers—economical plowing or trenching machinery for small isolated jobs. Eventually, large undertakings will decrease as the backlog of rural demand is satisfied.

Future jobs will lean more and more to short extensions from feeder plant now being placed. And, since the large investment in the massive plow train prohibits its use on these small jobs, a need for smaller equipment is apparent.

LEFT: FS type terminal installed on pole. RIGHT: Terminal installed on building in urban development.

Michigan Bell Pioneer

We are indebted to J. R. Kershaw, assistant chief engineer of Michigan Bell Telephone Co., for the following information on the experience of that company with buried wire and cable. This company's first buried wire was placed in service in 1937. This was a 17-gauge, unarmored facility, coded U distribution wire. During the following years, 1938 through 1940, the company buried about 3,000 miles of this type wire. World War II interrupted further buried wire placements until 1946.

This early buried wire was plowed in by the use of a commercial pan breaker, modified by the Bell Telephone Laboratories, and pulled by a four-wheel drive truck equipped with a special final drive gear reduction. Later in this period, Bell System designed plows (WC-24 and W-20) were used with the same type prime mover.

Following World War II, the first buried wire job of Michigan Bell was completed in December 1946, using 16-gauge armored distribution wire. However, until the introduction of a modified 16-gauge armored wire (coded B) in 1951 and a new unarmored 16-gauge wire (coded C) in 1952 this program was not extensive. This company also used considerable unarmored wire which is always buried with a shield wire. The following lists the total buried wire placed in plant by the Michigan Bell to date:

Year Ending	*Total Miles in Plant*
1952	6404
1953	7249
1954	7896
1955	9235
1956	10156
1957	11365

This wire was all plowed in. A major portion installed since the war was placed with the Bell System W-16 plow. This plow was standardized in 1949, and is pulled by one or two line trucks.

The first buried cable was installed by Michigan Bell in 1941. This was a toll cable placed between Saginaw, Standish, Lansing and Owosso, Mich., a total distance of 71 miles. In 1942, it buried 19 miles of toll cable between Saginaw and Midland. World War II interrupted further buried cable placement until 1947. In that year, twin buried K carrier toll cables were plowed in between Big Rapids and Petoskey, a distance of 138 miles. In 1948, a buried cable was placed between Petoskey and Mackinaw City. These cables were all installed for the Michigan Bell by the Long Lines Department of the AT&T, using its cable plowing trains.

Also, in 1947, this company buried 48 miles of cable by trenching between Salina and Adrian and Plymouth and Brighton. This covers all of the buried cable placed in Michigan prior to the introduction of polyethylene-insulated conductor cable (PIC).

Its first buried PIC cable was installed in the Indian River exchange during May 1952. This was a six-pair cable placed by the use of the Bell System W-16 wire plow, pulled by a line truck. As a result of the cost experience on this job, Michigan Bell started plowing in as much rural plant

as soil conditions, and PIC cable availability, would permit. The miles of cable placed per year for the years 1952 through 1957 are indicated as follows:

Year	*Exchange*	*Toll*
1952	245	536
1953	105	0
1954	178	38
1955	378	10
1956	294	46
1957	604	56

The Michigan Bell first considered urban buried construction for the following reasons:

(1) There are times when aerial construction, although traditional, is not at all desirable because of power hazards, etc.

(2) It is more attractive and desirable from the subscriber's viewpoint.

(3) Anticipated lower cable maintenance cost.

(4) Less likelihood of service interruption due to storms, acts of aggression, etc.

(5) Longer expected life.

Then, the following factors, occurring almost simultaneously, combined to bring about a trial of buried urban construction:

(1) Favorable experience with rural buried construction, coupled with an increasing awareness of the potential economics of buried construction.

(2) Several cost comparisons were made of the relative economy of buried vs. aerial construction in new subdivisions. All of these studies indicated that, on a project basis, buried construction was at least as economical as aerial construction. Of course, one of the main contributing factors was that, generally speaking, new projects present curving streets with the resultant anchoring problems.

(3) Availability of the Barber-Greene trencher.

Michigan Bell observes the following practices in the basic design of buried plant in new subdivisions.

A trench is provided for buried distribution cables and service wires to each house. Trenching, in this case, appears more advantageous than plowing, in that both cable and wires can be placed in the same main trench. The service wires leave the main trench via another trench to service entrance at the building.

The FS terminals are placed on a wood post 7 feet long with 3 feet in the ground and 4 feet above ground which is the usual height of residential lot fences. The wood posts may be cedar or preferably reused poles cut to 7-foot lengths.

The size of the terminal should be carefully selected with a view of economic and engineering considerations. It is considered desirable that the terminal housing be provided with a capacity of a minimum of 1½ times the anticipated maximum service requirements of serving location. It is further suggested that the initial number of pairs terminated in the terminals should usually be two or three in excess of the number of services which it appears will be working out of the terminal initially. The balance of the binding posts in each terminal may be left temporarily unconnected and spliced through at a later date, as required.

The distribution cable should be polyethylene-insulated conductor (PIC) cable of the size to provide for the ultimate requirements.

Depending upon the lot width, the terminals should be located so as to serve four to eight houses. When the lots are extremely wide, four houses should be served. In subdivisions of narrower width lots, six to eight houses may be served from one terminal.

One or more buried service wires should be placed to reach each house depending upon the price class of the subdivision. It is suggested that two service wires be placed to each house in a subdivision when the selling price of both house and lot is $30,000 or more.

The cable trench should be located a minimum of 3 feet from the rear lot line or a minimum of 3 feet from any poles set in the easement. However, in no case should the trench be located in the center of the easement. The minimum depth of the cable trench should be 24 inches; however, a depth of 30 inches should be obtained if possible. The terminal post should be located at least 2 feet off the side lot lines.

The service wire trench should preferably be located in the center of the lot and run from the cable trench to the service entrance at the house. The trench to a house, on which construction has not started at the time of placing the buried facilities, should terminate approximately 10 to 15 feet from the building line and a sufficient coil of wire to reach the house buried at this point. A wooden stake driven into the ground at this point will locate the buried coil. The installation forces will extend the trench to the house by hand digging at a later date. The service wire trench may be located near the side lot line due to proposed septic tank location or other reason, but in no case less than 2 feet from the side lot lines. In situations where the lot size and/or house location is indefinite it may be advisable to defer placing a service wire to this location. The buried wire is to be placed at a depth which will result in a final cover of at least 20 inches.

At the start of the Michigan Bell's buried facilities program, a search was begun for an inexpensive cable terminal to distribute a pair of wires to customers along the route. At that time, all of the Bell System's standard terminals had been designed for use on paper (or pulp) insulated cables and required a moisture-proof cable closure. However, in view of the moisture-proof characteristics of the polyethylene insulation it was decided that an entirely new approach might be employed. For

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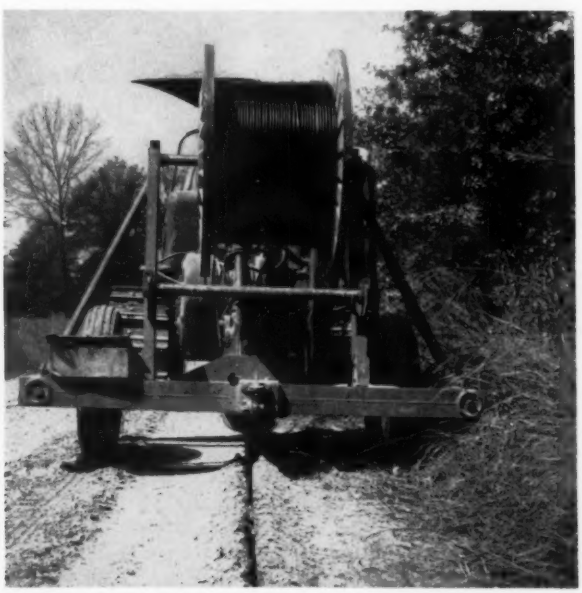

Cable entering ground in a plowing operation.

today's

Highlights

of finance-taxes-business trends

by Willard F. Stanley

BOND MARKET DEBACLE: Weakening of bond prices experienced in the 30 days, ended July 15, could be termed "unexpected"—but how shall we define the ensuing plunge in these prices which occurred in the following 30-day period, ending Aug. 15? Even superlatives fail to be sufficiently expressive. Where moderate improvement in bonds had been looked for during this period—at least nothing worse than stability—federal government bonds receded in price over five points and corporate issues likewise. As a result, as this is written, yields are trending again toward the highs of last Fall, and may, perhaps, exceed them.

That usual testing medium, Wall Street Journal's tabulation of new utility funded debt issues, showed an increase in yields on 15 such new issues of 27 decimals (0.27 per cent per annum) on the basis of bid prices for these securities on Aug. 12, as compared with the average yields based on their original offering prices. This increased average yield represents a decline of over five price points in these new issues since they were offered—as from 100 to 95 cents on the dollar.

Strangely enough, federal government bonds have been almost the sole culprits in bringing about these adverse conditions. New corporate debt offerings were not high in number or amount during the 30 days before Aug. 15, so the fall in bond prices cannot be blamed on an excessive supply of new securities. For the two-week period ended Aug. 8, the only corporate funded debt offering was 2.1 million dollars of equipment trust certificates of a railroad.

The cause of the trouble lies entirely in the drastic break in government bond prices, due to continued heavy selling of these securities at what might be termed "panic" prices. The securities dumped on the market were those bought in connection with the federal government's debt offering of about June 15 in the hopes of speculative profit. When the market for federal bonds slipped downward, these speculators tried to unload, and there have been several serious waves of this liquidation.

It seems strange to think of pressures from frenzied dumping of government bonds—the safest security one can think of. But, the conditions were most unusual. Large blocks of these bonds were bought on slim margins. During recent periods, borrowings by New York stock exchange members to carry government bonds for themselves and their clients rose more than 120 per cent to the highest point in over 15 years.

Two electric utilities postponed offerings of funded debt, scheduled for early in the week of Aug. 11. Consolidated Natural Gas proceeded with its offering of 35 million dollars in debentures, a triple "A" rated security. These were offered that week at a yield of 4.30 per cent.

A month or so ago the prevailing level for double "A" rated bonds was about 4 per cent. Electric utility bonds in a triple "A" rating might command a slightly

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better yield, perhaps as low as 4.2 per cent, but allowing a 0.20 per cent differential between the double and triple "A" ratings, the Consolidated offering indicates an advance in yields on new utility funded debt of around 0.50 per cent (one-half of 1 per cent) per annum in the last 30 days. Last issue offered previous to the Consolidated was double "A" rated El Paso Electric, offered during the week ended July 25 in the amount of 6.5 million dollars on a 4.1 per cent basis.

It appears it would be conservative, under conditions now existing, to anticipate a yield of at least 4.2 per cent for new triple "A" rated electric utility funded debt, 4.5 per cent for double "A" ratings, and 4.8 per cent or higher for the single "A" rated category.

Is this decline temporary or likely to persist? The immediate cause seems relatively temporary, i.e., forced liquidation of an unprecedentedly high speculative position in government securities. The end to this kind of selling can hardly be very far off.

But, this favorable factor—the relief of pressure on the government bond market and its possible "snap-back" along with corporate bond prices—is more than offset by two unfavorable overhanging factors, either of which could have a substantially adverse effect.

First of these is the accumulation of new issues for subsequent offering. Schedules for the next 30 days are fairly heavy already and if the amounts are augmented by deferral of offering of early forthcoming issues (two have already been so deferred), excessive supplies of new securities can easily develop, with consequent pressure on prices and increase in new offering yields.

Second, and equally important, is the switch in Federal Reserve credit policy which has just occurred, viz., increase in the discount rate of San Francisco district banks from 1¾ per cent to 2 per cent. This will no doubt be promptly followed by similar increases applicable to member banks in other regions. This will raise the bank borrowing rates and result in costlier short-term credit, ultimately extending over to adversely affect the long-term funded debt market. Even before the Federal Reserve announcement, short-term debt had reflected considerable increases in interest rates, U. S. Treasury bills, for example, moving from around 1.2 per cent to something like 1.6 per cent.

What to do under such drastically adverse circumstances, with so bleak an outlook for the near future? Normally, the author would feel that when yields had risen to such high levels, the odds (based on financial history) would favor waiting for better days. Here, however, the bond market is faced with such serious continuing problems that we hesitate to so advise. Informed opinion feels that present or even lower bond prices may be experienced over the next 60 to 90 days.

Viewed in this light it seems dangerous to delay any financing which cannot be deferred conveniently (with the assistance of bank loans, etc.) for 6 months or more, and particularly scheduled financing which must be completed within a maximum of 90 days. Where the longer period of deferral seems feasible, then a postponement, while obviously a gamble, may prove a fruitful one and seems to have the odds on its side. Otherwise it may be wisest to proceed as per schedule and offer the new securities on the best basis possible.

* * * *

"DOG DAYS" IN STOCKS: While bond prices plunge into the abyss, stocks climb to astronomical heights. The "dog days" are here and numerous stock speculators (they can hardly be called investors any longer) give indications of having been bitten and of having become rabid in consequence. At the close of business Aug. 19, the New York Times average of 50 combined stocks was about 17 per cent above the 1957 closing level, having substantially cancelled the decline in the average from Dec. 31, 1956 to the end of 1957. At July 14, equivalent increase in the average over Dec. 31, 1957 was 10 per cent. The past 30 days have witnessed almost a 70 per cent rise in the increased level of prices compared with the end of last year.

Thirty common stocks, whose earnings were reported on one recent day, were then selling at a price equal to about 19 times average earnings for the second quarter or first half of 1958, annualized to a yearly basis. Also, a leading statistical service found very recently average yields on the stocks comprised in its "average" were at the rate of 3.79 per cent, compared with average yield of 3.71 per cent on high grade bonds. Since then, contrary movements of these two markets have no doubt brought the stock yield below that on the bonds. Something is wrong somewhere. Needless, to say, new commitments demand extreme care. Switching to stronger issues may help and utilities remain a strong defensive refuge.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

ON THIS PAGE in the July 12 issue we mentioned that it was a pity there wasn't any way to make an emergency call from our many outdoor type telephone booths without depositing a coin.

The response to this item has been tremendous. We have had many letters and telephone calls from persons throughout the country and so far everyone has been in agreement that something should be done to make it possible to originate a call from a paystation in an emergency, even though the necessary coin may not be available.

Perhaps the most complete letter we have received on this subject is from Hugh M. Hamilton, of El Segundo, Cal. He has done such a good job in outlining this problem that we quote most of his letter as follows:

"First, I shall describe the operation of the paystations used here in the El Segundo exchange. The exchange is served by a W.E. No. 5 Crossbar central office which is equipped for Foreign Area Customer Dialing (Direct Distance Dialing).

"All paystations in the exchange are W.E. prepay instruments, the type used in most Bell System exchanges of any size. Upon lifting the handset of one of these paystations, nothing can be heard until two nickels or a dime are deposited.

"Then, provided that the line is not dead, the dial tone is heard. If the line is dead, the paystation user has just said goodbye to 10 cents. (Obviously, if the line is dead, current from the central office cannot reach the instrument to return the coins when the handset is replaced.)

"The two big disadvantages of this type station are (1) the user cannot determine whether the line is dead until it is too late, and (2) the *user must deposit a coin even if he is calling the emergency operator or any other operator.*

"It states in the telephone directory for this area that no charge will be made on paystation calls to any operator or the telephone company business office. This statement is true, to a certain extent. The paystation user must deposit 10 cents to call the emergency operator, or any operator, but the coins are returned upon completion of the call.

"There are various solutions to this problem. One of these entails the use of semi-postpay paystations (coins are deposited when the called party answers; otherwise, the transmitter is shorted, and the called party cannot hear the paystation user.)

"These paystations are presently used only in . . . small exchanges; the time consumed depositing coins while the called party waits does not suit these instruments to large exchange operation. But, for small communities where semi-postpay instruments are already in use, the paystations could be modified so that the transmitter is not shorted on calls to an operator.

"For larger exchanges with prepay paystations, I believe that the following plan could be used to advantage. First, all free numbers (operators, telephone business office, etc.) would be assigned a one-, two-, or three-digit code, depending upon local conditions, which would begin with the digit '1' or '0' in order to set them apart from local telephone numbers which would begin —as they do now in most areas—with the digits '2' through '9'.

"As the second step, the central office equipment would be modified so that the dial tone would be heard immediately upon lifting the handset. (Many Automatic Electric Co. paystations operate in this manner.)

"Thirdly, a recorded announcement or special tone would be provided to warn the paystation user should he dial an ordinary number without depositing a coin. To further illustrate this system, I will use the following examples:

"(1) A man has just discovered a fire in a nearby store and wants to report it to the fire department. After locating a paystation, he reads the '*emergency calls*' card, which would be mounted on the instrument or in the booth, and learns that the number for the fire department is 159. To place the call, he lifts the handset and, upon hearing the dial tone, dials 159 without depositing any coins, and is immediately connected to the fire department's line.

"(2) Another man desires to call a business associate. He goes into a telephone booth. When he lifts the handset, there is no dial tone to be heard. Because he always reads the instructions on the telephone (of course, not everyone does bother to read them) he knows that something is wrong with that particular instrument, so he locates another telephone. Upon lifting the handset this time he hears the dial tone, and deposits a dime or two nickels and dials the number he wants. On a call of this nature, the coins would be collected if the call were completed and would be refunded if there were no answer, the line was busy, or for some other reason, the call was not completed.

"(3) Next comes the man who is determined to cheat the telephone company out of every dime possible. He wants to call a girl friend who, of course, does not have a free number. But he thinks that he can get away with a call without paying 10 cents. So he lifts the handset on the paystation, hears the dial tone, and dials his girl friend's number. He is quite surprised and disgruntled to hear a recorded voice politely informing him that he must hang up and place his call again, this time depositing 10 cents when he hears the dial tone.

"It is my opinion that this system could be used without an undue amount of central office equipment modification, and would give telephone companies' community relations a real boost.

"I should also like to discuss another sore spot in the paystation network in the United States—the instruction cards on the instruments. In many localities, these are horribly inadequate. In many communities, I have noticed that the cards simply state: 'Lift the handset, dial the number, and deposit coins when the party answers.'

"Many of these cards are supplied by the manufacturer without regard to

(Please turn to page 38)

Holds the line...on costs

The Volkswagen Panel Delivery Truck brings telephone companies important savings in fleet operations. This versatile truck carries an 1830-lb. payload and has a capacity of 170 cu. ft. Loading space is easily accessible and adaptable to special racks and bins for tools and equipment.

Besides Volkswagen's roomy and practical design, outstanding gas economy, ease of handling and parking, its great popularity is based on its remarkable low maintenance.

The engineered dependability of every Volkswagen is backed up by world-famous VW service in all 49 states. When service *is* needed, every VW owner gets the best. The investment in a Volkswagen Truck pays dividends. Real savings mile by mile add up year by year. Ask your authorized VW dealer to show you the operating cost records for a Pick-up Truck, Panel Delivery or Kombi Station Wagon. A Volkswagen costs less to buy, run, and maintain.

VOLKSWAGEN DELIVERS THE GOODS . . . FOR LESS!

VOLKSWAGEN

Courts and Commissions

OK Use of Directory Cover Without Advertising in Neb.

The Nebraska Railway Commission on Aug. 6 gave permission to the Northwestern Bell Telephone Co. to amend its tariff to permit customers to furnish their own binders for telephone directories, providing the binder does not contain advertising matter and does not interfere with the use of the directory.

In another order, the company was authorized to include in its general rules and regulations a method of computing charges for special services and equipment which will consider the following factors:

(1) Cost of maintenance.
(2) Cost of operation.
(3) Depreciation based upon cost installed.
(4) Administration, taxes and uncollectible revenue.
(5) A reasonable amount for return and contingencies.
(6) Any other specific items.

Charge Residence Rates For Dorms, Wis. Bell Ordered

The Wisconsin Public Service Commission on Aug. 8 ordered the Wisconsin Telephone Co. to discontinue charging business rates to customers, such as University of Wisconsin rooming house operators, who provide telephone service to rooming house tenants (TELEPHONY, Feb. 1).

The commission ordered the company to apply its residence rates in these cases. Also, the commission directed that upon demand of rooming house tenants the company shall furnish pay-station service.

Hearings on the business rates were held first in January at the instigation of the University Independent Housing Association, a group of Madison rooming house proprietors.

In 1956, the company began changing the rate classification of student rooming houses in Madison with accommodations for six students or more.

Before that time, this telephone service had been charged for at residence rates. The commission noted that this change in policy was based on a university policy requiring a full-time supervisor in rooming houses occupied by six students or more.

The company said it was willing to provide residence service for roomers or supervisors on an individual basis, but the company contended that when service was made available to all roomers it was used in connection with a business enterprise.

The commission noted that the major use of telephone service in rooming houses is between 4:30 p.m. and 11 p.m., a period during which telephone service for business purposes is relatively low.

Rule Toll Rates Apply to All; OK Stock; Refuse Delay in Ind.

The Indiana Public Service Commission on Aug. 1 denied the petitions of subscribers of the Illinois Bell Telephone Co., Moores Hill Telephone Co., General Telephone Co. of Indiana, and Southeastern Indiana Rural Telephone Co-op, Dillsboro, requesting that intrastate toll raises granted to Indiana Bell Telephone Co. should not apply to them (TELEPHONY, May 17).

The commission, in granting the increase to Indiana Bell, had extended it to all telephone companies doing business in Indiana.

The petitioners had complained that the increases should not apply to all telephone companies in the state without separate hearings.

In its current ruling, the commission said that it is proper to apply the rates to all companies in the interest of fairness.

•

Also in Indiana, the commission authorized General Telephone Co. of Indiana, Fort Wayne, to issue 60,000 shares of stock at $50 per share to pay a bank loan of $2,150,000 and for construction (TELEPHONY, Aug. 2).

The Pulaski White Rural Telephone Co-op, Star City, was denied a request to delay an Aug. 12 hearing on the alleged requiring of non-members to pay an "initiation fee" before getting service (TELEPHONY, Aug. 9).

Uphold Facility Relocation Provision in Texas

Texas District Judge J. Harris Gardner on Aug. 13 upheld the constitutionality of a state law providing that funds of the state-federal interstate highway program can be spent for relocating utility facilities as well as for purchase of right-of-way and for highway construction (TELEPHONY, May 31).

Judge Gardner granted motions for summary judgment upholding the law filed by Southwestern Bell Telephone Co., two gas companies, and the cities of Dallas and Austin.

If upheld on appeal to higher courts, the decision will mean that cities, as well as utilities, will be spared the expense of relocating lines and other facilities along the 2,905 miles of major highways being improved in Texas. Cost of such relocations has been estimated as high as 100 million dollars.

In his ruling, Judge Gardner cited a recent decision by the Minnesota Supreme Court upholding a similar law in that state. It was noted that the state constitution of Minnesota contains restrictions similar to those of Texas prohibiting use of public funds to assist private corporations.

However, a state assistant attorney general, H. Grady Chandler, pointed to one difference between the Texas and Minnesota laws. The Texas measure provides for full payment on relocating the utilities, while the Minnesota law calls for payment of only the share covered by federal funds and allows no use of state funds for the purpose.

Ask Damages From AT&T Over Private Line Rates

A complaint against the American Telephone & Telegraph Co. calling for nearly $80,000 in damages was filed with the Federal Communications Commission during the week of Aug. 11 by the Reynolds Metals Co.

The company said the amount involved is based on the difference between what the company paid AT&T over the past year for private line telephone circuits and what would have

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been the charges for the same circuits under AT&T's new private line tariffs, which were filed under protest, becoming effective Aug. 24. The new tariffs were filed following a direction from the FCC to reduce the private line telephone revenues by 15 per cent (TELEPHONY, Aug. 9).

The complaint pointed to the FCC's orders of June 25 and July 25 which it said found the rates set forth in the existing private line tariff "to be unjust and unreasonable and therefore unlawful."

Reynolds said its payments for the private line service, therefore, "were unjust and unreasonable and consequently in volation" of the Communications Act and that "such charges provided an excessive rate of return or profit to AT&T. . . ."

Sue Over Option to Purchase Stock in Ohio Mutual

William C. Henry, president of the Northern Ohio Telephone Co., Bellevue, has filed suit in Hancock County Common Pleas Court against the Van-Buren (O.) Mutual Telephone Co. and the mutual's shareholders and directors, it was reported on Aug. 5.

Mr. Henry asked the court to order the performance of a contract between himself and the defendants giving him an option to purchase shares in the mutual.

He claimed that the stockholders have refused to sign and deliver share certificates to him or to his agent.

The court enjoined the defendants from selling or otherwise disposing of shares except to Mr. Henry and enjoined the company from transferring shares on its books to anyone other than Mr. Henry until final determination of the case.

Authorize Raise, Sale For Wash. Independent

The Washington Public Service Commission on July 31 authorized Community Utilities, Inc., Quilcene, to increase its telephone service rates so as to provide an 8.28 per cent return, based on 1957 operations (TELEPHONY, May 3).

The commission said. ". . . (We) wholeheartedly concur with the proposition that maintaining utility rates at the lowest possible level consistent with adequate and efficient operations is a laudatory goal. We are not of the opinion, however, that rates should be allowed to remain at levels that preclude the company from discharging its public service obligations. Furthermore, it is the responsibility of management to seek the rate level necessary to provide the quality of service that is, under the law, the right of the utility subscriber."

The commission also, on Aug. 1, allowed the company to sell all its property in the state of Washington to Washington Utilities, Inc., a wholly-owned subsidiary of Community Utilities, Inc. This will place the operations of Community Utilities, Inc., in Washington under Washington Utilities, Inc., while the Alaska operation remains under Community Utilities, Inc.

REA Approves $1,279,000 In Loans

The Rural Electrification Administration approved two telephone loans totaling $1,279,000 during the week of Aug. 11 to borrowers in Michigan and Wisconsin, the U. S. Department of Agriculture announced on Aug. 18.

About 2,138 farms and other rural establishments will receive new or improved telephone service as follows:

Chibardun Telephone Co-op., Inc., Dallas, Wis.; $1,057,000; Aug. 13.

The borrower, a recently formed cooperative, plans to improve service for 1,434 rural subscribers and to furnish initial service to 305 farm families. As a nucleus for the new system, the cooperative proposes to acquire, improve, and expand the following telephone facilities: Prairie Farm, Ridgeland, & Dallas Telephone Co., Prairie Farm; the Dallas Cooperative Telephone Co.; and the Hillsdale & Western Telephone Co., Hillsdale. The companies are now providing magneto service to 1,434 rural subscribers. Central offices are located at Prairie Farm, Ridgeland, Sand Creek, Dallas, Arland, and Hillsdale.

The new system will be served by five exchanges. Arland and Hillsdale will be served from one automatic exchange located between the two villages; and the remaining four magneto central offices will be replaced with new automatic offices. The present Dallas building will be remodeled for use as headquarters for the system.

B. L. Murch is president and Andrew M. Omtvedt is manager of the Chibardun Telephone Co-op.

•

Shiawassee Telephone Co., Perry, Mich.; $222,000; Aug. 15.

The borrower proposes to use these loan funds to improve service for 282 rural subscribers, to furnish initial service for 117 farm families, and to complete construction of the system approved in a prior loan. The present subscribers are now receiving magneto service from the Morrice Telephone Co. The Shiawassee company plans to acquire these facilities and integrate them.

The additional subscribers in the Morrice area, provided for in the loan, will be served from the borrower's Perry exchange, now under construction. The two REA loans, totaling $582,000, will enable the borrower to furnish new and improved service to 1,426 rural subscribers.

Russell Brandt is president and William C. Schmidt is manager of the Shiawassee Telephone Co.

West Coast Gets Bond OK From Oregon Commissioner

The Oregon Public Utility Commissioner recently authorized the West Coast Telephone Co., Everett, Wash., to sell 4 million dollars of 4⅜ per cent bonds, due in 1985, to the following insurance companies:

John Hancock Mutual Life Insurance Co.
Aetna Life Insurance Co.
Occidental Life Insurance Co. of California.
Pacific Mutual Life Insurance Co.
Aid Association for Lutherans.

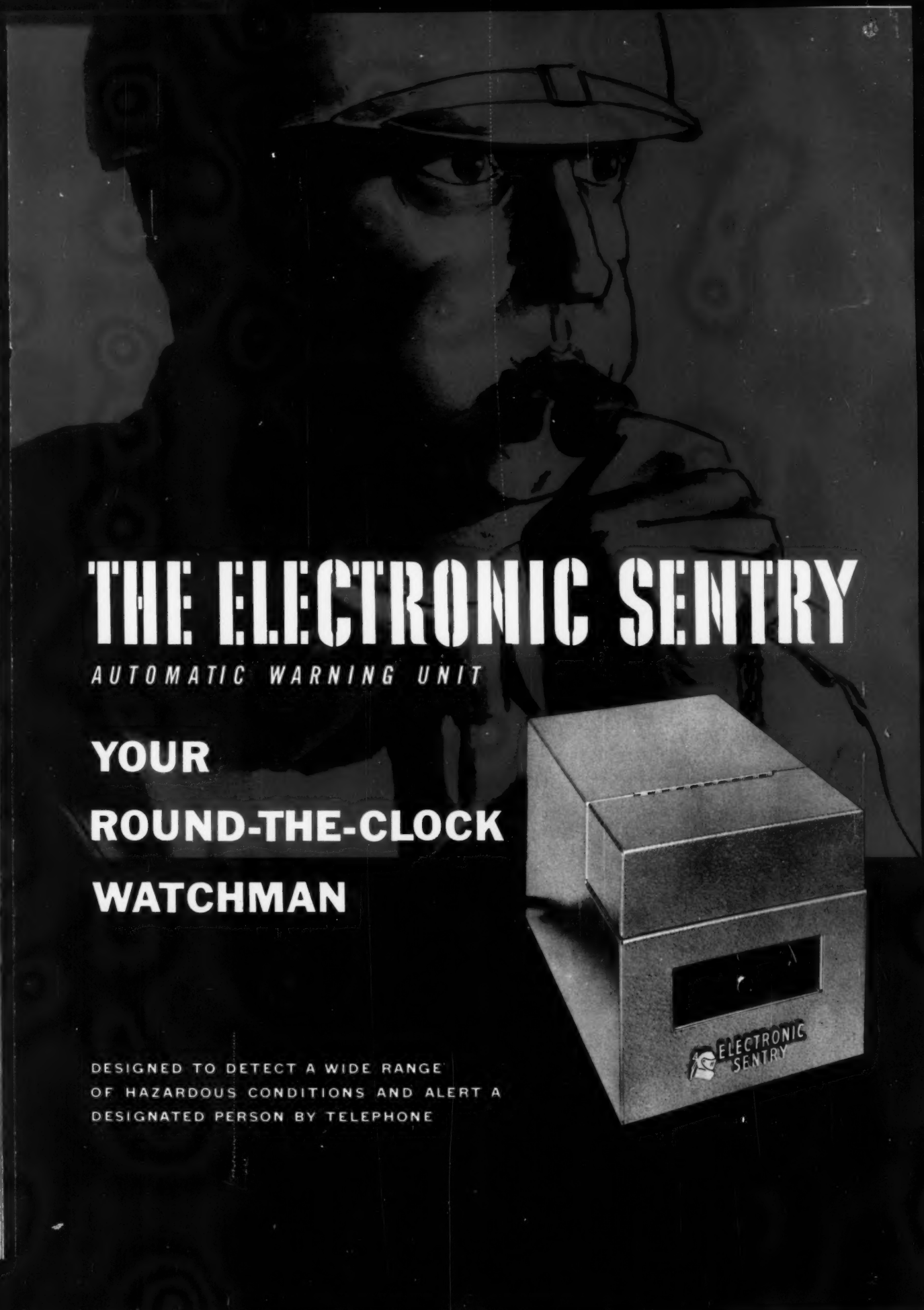
Purpose of the issue is reimbursement of the company's treasury for expenses of construction, completion, extension and improvement of its facilities and of its subsidiary, West Coast Telephone Co. of California.

Diamond State Asks Rate Raise in Delaware

The Diamond State Telephone Co. on Aug. 15 filed a petition for $1,073,700 in increased rates with the Delaware Public Service Commission to go into effect on Sept. 15.

The commission on Jan. 15 denied the company $773,334 of $1,880,000 sought in increased rates. The com-

(Please turn to page 33)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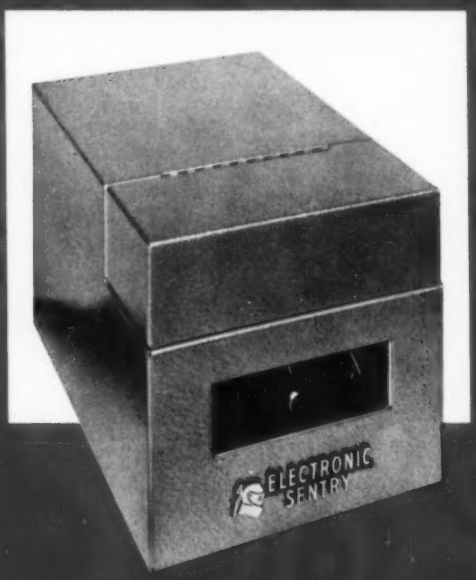
A NEW TYPE OF ELECTRONIC SAFETY DEVICE THAT TELEPHONE COMPANIES CAN FURNISH THEIR CUSTOMERS



The Electronic Sentry is an automatic warning unit which notifies, by telephone, a responsible person whenever a condition dangerous to human life or property arises. It provides inexpensive twenty-four hours a day notification of hazardous conditions which might be caused by fire, loss of pressure, water levels, temperature, theft or malfunctioning of machinery or processes.

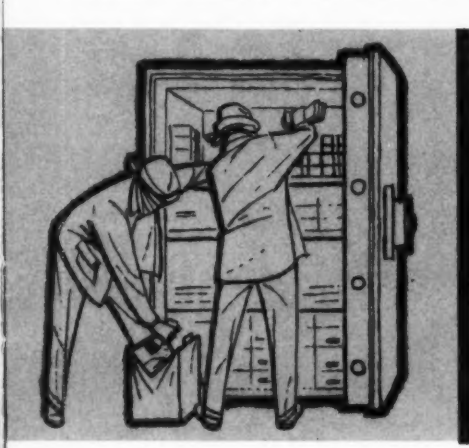
Here's the way it works. The Electronic Sentry is connected to the telephone line and a primary detecting device is connected to the Sentry. This detector may be a thermostat, pressure control, water level indicator, photocell or any control capable of closing a switching circuit. When the detection device activates the Electronic Sentry, it will automatically seize the telephone line. A predetermined telephone number is dialed and the warning message is repeated to the called party. This warning message is cut into a regular 6" phonograph record. The message is repeated several times. At the end of the first call the Electronic Sentry will disconnect itself from the telephone line. It will, however, dial the number again and again to deliver the warning message and will repeat this procedure until the unit is disconnected or the reported condition is fixed.

NOTE: To avoid tying up a line by repeated calls, the Sentry may be provided with an Interval Timer which will place the warning call at predetermined intervals. These intervals may be as desired, that is every five, ten or fifteen minutes, etc. This is an optional attachment.

COMPACT, EASILY INSTALLED UNIT

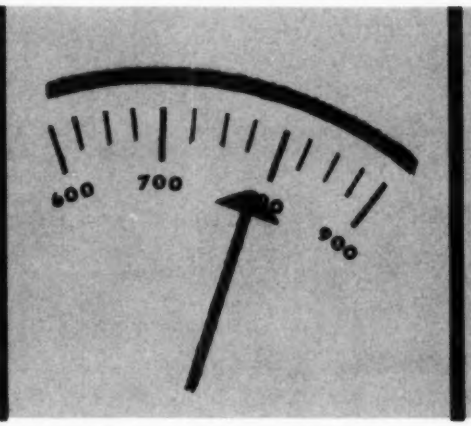
The Electronic Sentry unit consists of a specially designed record player with a six-inch record, an electronic relay amplifier and an audio-amplifier. It is housed in a compact gray, hammerloid-finished metal cabinet of rugged construction. Its over-all dimensions are 8 inches wide, 8¼ inches high and 11¼ inches long. It weighs only 17½ pounds. Installation is accomplished simply by plugging the unit into standard 110 volt A.C. current and connecting it across the telephone line. Then the detection unit adaptable to the particular application is connected to the Sentry unit.

THE ELECTRONIC SENTRY WARNS AGAINST:



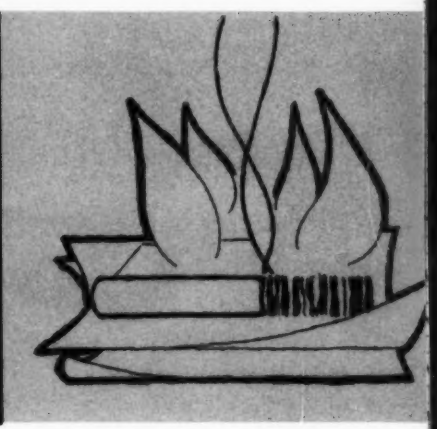
THEFT

Especially valuable to store owners, warehouses and other commercial establishments. Upon the forcible entry, the detecting device will set the Sentry in action calling the responsible party.



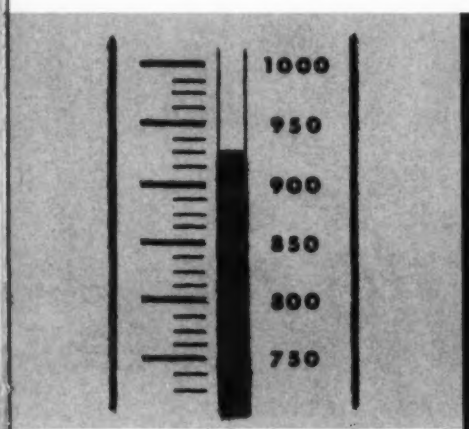
PRESSURE

Whether it would be water or steam pressure serving a public institution, a pumping station or water reservoirs, the Electronic Sentry will promptly call a designated person to correct the situation.



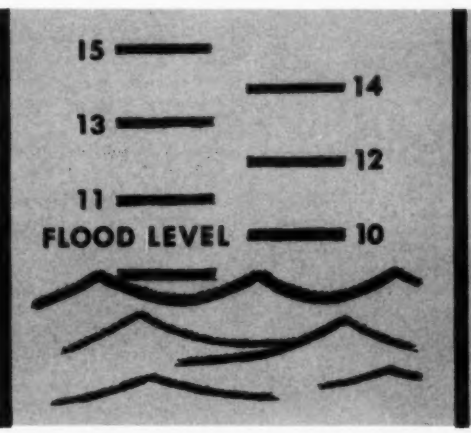
FIRE

For refineries, central heating plants, bulk oil stations and all industrial and commercial establishments, the Electronic Sentry is a valuable safety device. When a fire triggers the detection device the Electronic Sentry dials the proper authority and reports, by telephone, the location of the fire.



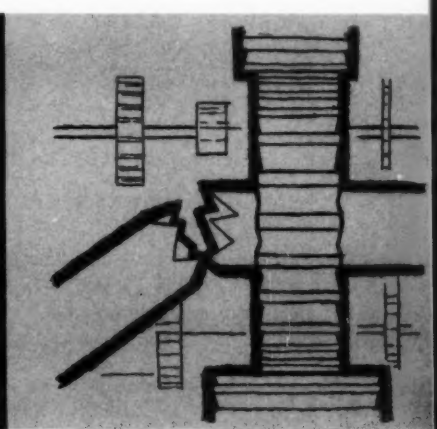
TEMPERATURE

The Electronic Sentry can play an important part in businesses that rely on correct temperatures. Among these are chicken hatcheries, frozen food lockers, dairies, greenhouses and similar commercial establishments.



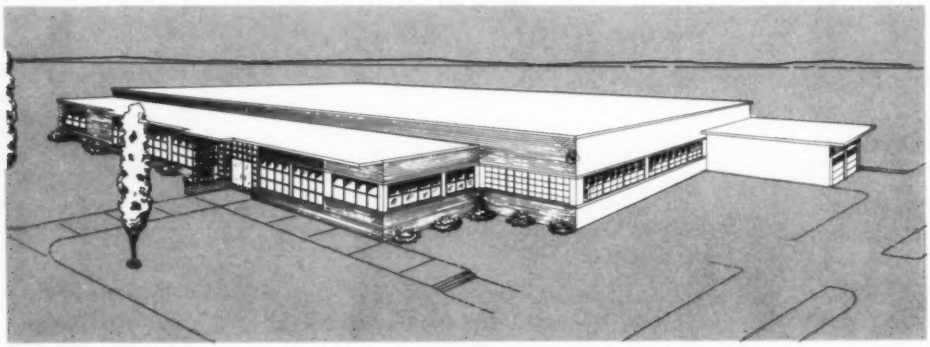
FLOOD LEVEL

Everyone knows how costly flood damage can be especially to utilities, city water works and pumping stations along with other industrial plants. Here again, the Sentry can immediately notify the engineer in charge of the situation.



MALFUNCTIONS

Should your type of operation encounter mechanical failure, the Sentry can notify the authorized individual that a motor or pump is not functioning properly and needs attention.



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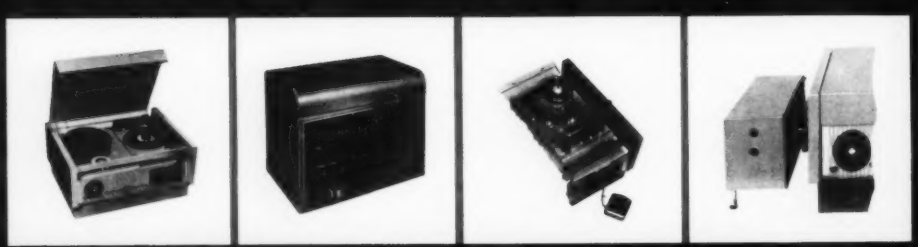
AUTOMATIC ELECTRIC SALES CORPORATION, NORTHLAKE, ILLINOIS

OTHER PRODUCTS BY ELECTRONIC SECRETARY INDUSTRIES



ELECTRONIC SECRETARY — MODEL T-T — T-A ADAPTER — REMOTE CALLBACK

Printed in U.S.A.

pany appealed the commission decision to the superior court which reversed four of the commission's rulings and paved the way for restoration of $268,-703 out of the $778,334 denied to the company by the commission.

In the most recent action prior to the filing of the new application by the company for rate increases, the commission announced it intended to appeal the superior court decision to the Delaware Supreme Court (TELEPHONY, Aug. 23).

Sell S. D. Independent

Mr. and Mrs. Ben Hall, owners of the Avon (S. D.) Telephone Co. since February 1941, are selling the company to Orval Elliott of Charlo, Mont., effective Oct. 1. Mr. Hall is retiring after being in the telephone business for 54 years.

Approve Dial Rates in Miss.

The Florence Telephone Co. on Aug. 8 was granted permission by the Mississippi Public Service Commission to increase rates at the company's Prentiss and Bassfield exchanges upon conversion to automatic operation.

Approve Bell Sale in S. C.

The Federal Communications Commission has approved the sale of the Central (S. C.) Telephone Co. to the Southern Bell Telephone & Telegraph Co., it was reported on Aug. 9 (TELEPHONY, Apr. 5).

Lincoln (Neb.) T&T Asks Purchase Approval

The Lincoln Telephone & Telegraph Co. on Aug. 15 filed an application with the Nebraska Railway Commission to buy the Farmers & Hallam Telephone Exchange, Hallam, and other companies in the Hallam area.

The Lincoln company plans to install dial service to serve the 141 subscribers involved.

Recently, the Consumers' Public Power District began the construction of an atomic energy power plant in the Hallam area. This is expected to increase the requirements for telephone service.

General of N. Y. Receives Stock Sale Approval

The New York Public Service Commission on Aug. 22 authorized General Telephone Co. of Upstate New York, Inc., Johnstown, to issue and sell to its parent company, General Telephone Corp., 22,000 shares of no-par-value stock at $50 a share (TELEPHONY, June 28).

The proceeds of 1.1 million dollars to be derived from the sale will be used to retire $800,000 in outstanding notes issued by the company to Bankers Trust Co., with the balance being used to finance the company's continuing plant improvement program.

The company was also authorized to amend its certificate of incorporation by increasing to 150,000 the number of shares which it is permitted to issue.

AT&T, W.U. Ask Raise For Teletypewriter Service

American Telephone & Telegraph Co. and Western Union Telegraph Co. asked the Federal Communications Commission for authority on Aug. 15 to raise rates on Oct. 1 on interstate private line teletypewriter services.

They asked the FCC to approve interim increases, pending completion of commission study of charges and regulations.

The AT&T said the proposed higher rates would increase revenues by 11 million dollars. It said its present earnings of 1.7 per cent on invested capital were "completely inadequate."

Western Union said its proposed increase would produce a 6.7 per cent rate of return, according to its own

(Please turn to page 37)

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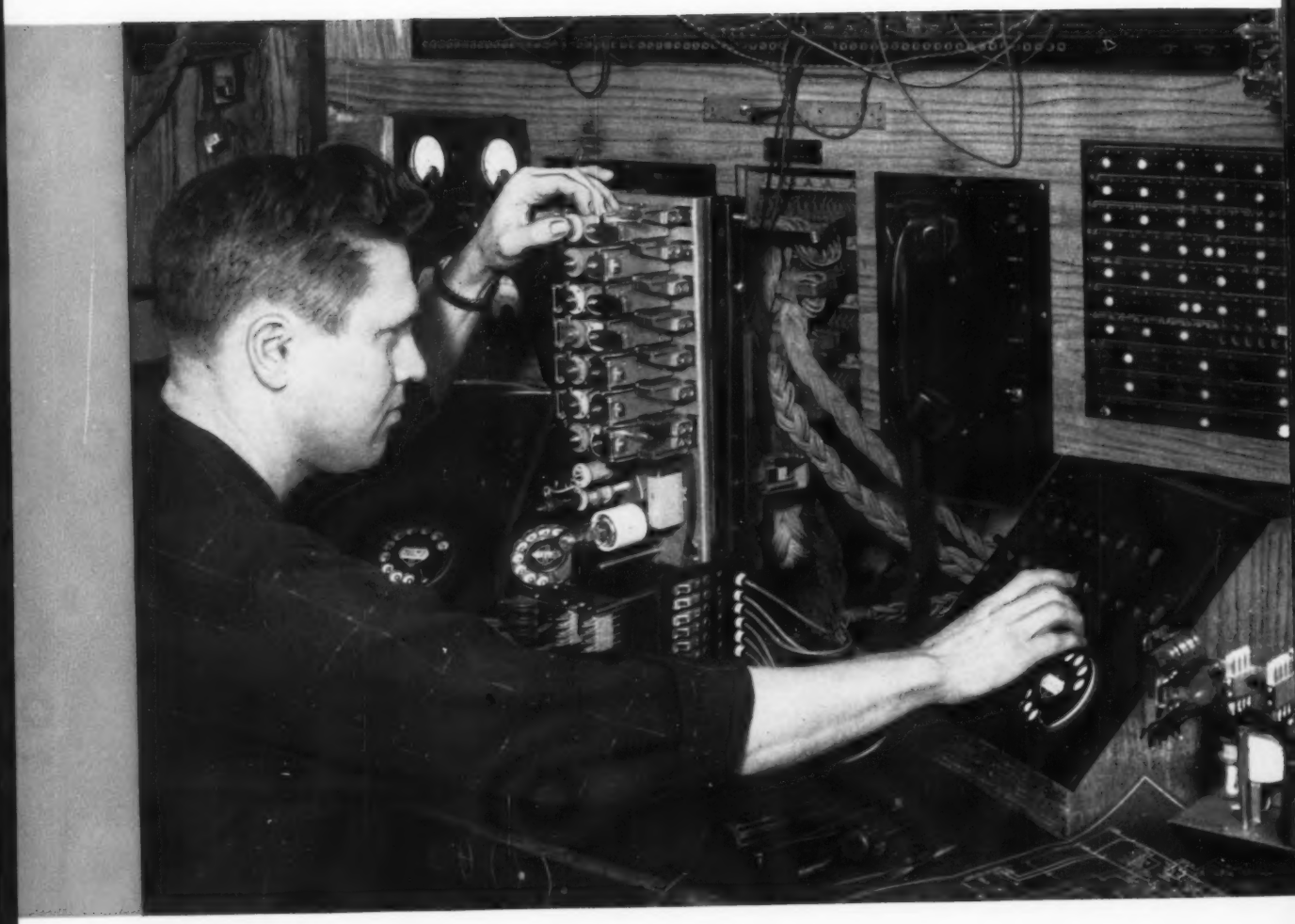

another reason why Men Choose Strowger!

Just before it is shipped, your Strowger Automatic telephone equipment proves its fitness for your specific service. Each unit is put through its paces under conditions as close as possible to those in your exchange. Strowger *must* pass these tests with flying colors before it is tagged "OK to ship."

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Typical Preformed Tangent Support application. Transposition can be accomplished by twisting the support before hanging.

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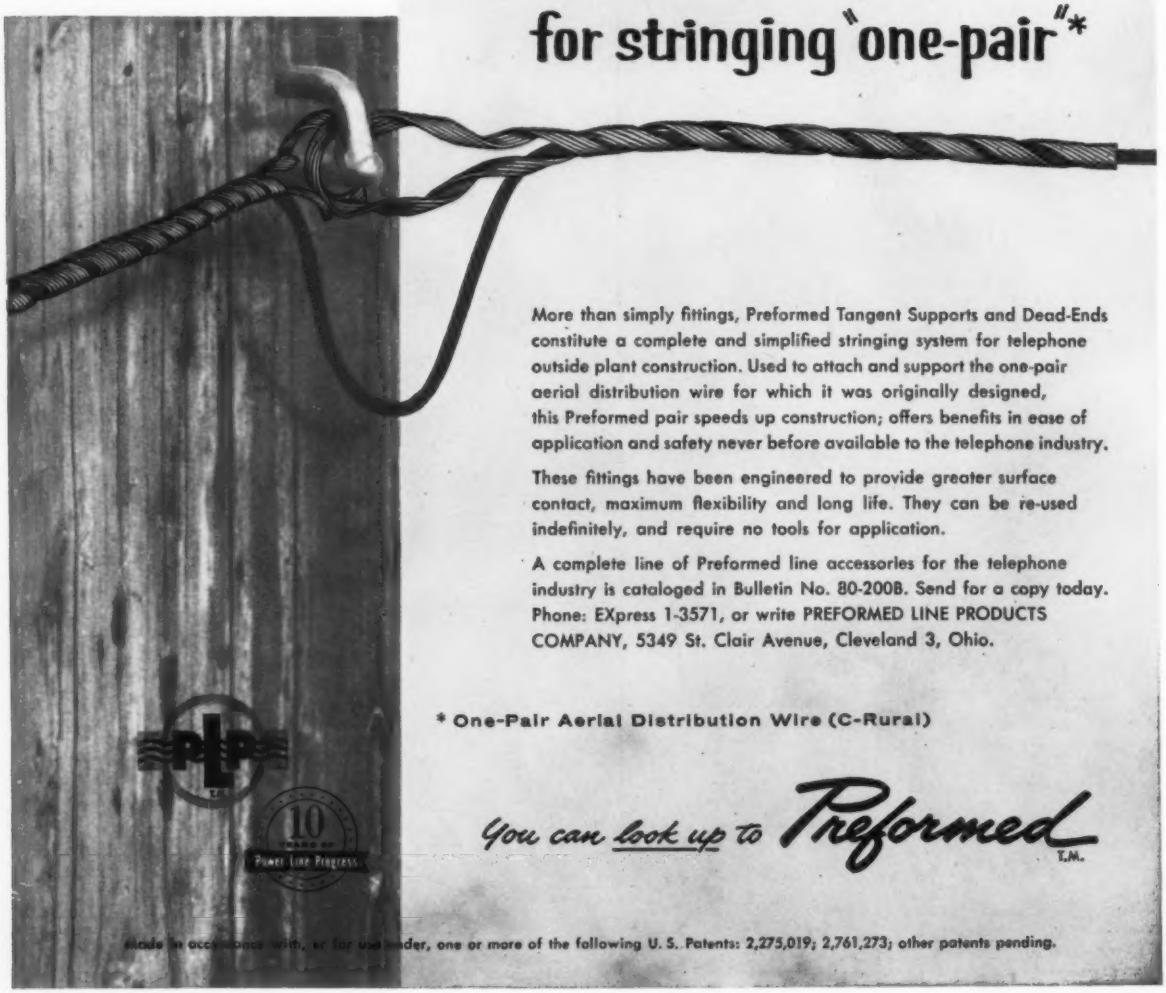
Typical corner installation with two Preformed Dead-Ends permitting application without cutting the wire.

the accepted pair for stringing "one-pair"*



More than simply fittings, Preformed Tangent Supports and Dead-Ends constitute a complete and simplified stringing system for telephone outside plant construction. Used to attach and support the one-pair aerial distribution wire for which it was originally designed, this Preformed pair speeds up construction; offers benefits in ease of application and safety never before available to the telephone industry.

These fittings have been engineered to provide greater surface contact, maximum flexibility and long life. They can be re-used indefinitely, and require no tools for application.

A complete line of Preformed line accessories for the telephone industry is cataloged in Bulletin No. 80-2008. Send for a copy today. Phone: EXpress 1-3571, or write PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Avenue, Cleveland 3, Ohio.

* One-Pair Aerial Distribution Wire (C-Rural)

You can look up to Preformed T.M.

Made in accordance with, or for use under, one or more of the following U. S. Patents: 2,275,019; 2,761,273; other patents pending.

figures, or 7.4 per cent according to commission cost studies.

The proposed increases by Western Union also would cover its facsimile service. Western Union said it expected a gross revenue increase of $7,693,000 a year from proposed new charges, without taking into effect possible loss of business from these higher rates.

At present, Western Union said, it is receiving a 2.3 per cent rate of return, before taxes, on its teleprinter service.

General of Florida Seeks Increase of $4,000,000

The General Telephone Co. of Florida on Aug. 19 sought authority to increase its rates an additional 4 million dollars a year.

General Telephone cited increased costs as the basis for its proposed higher rates. It said that with the new rate, its return on company investment would be 7.25 per cent.

The company asked for rates that would vary according to the number of telephones in each city and cities within each numerical bracket would have the same rates under the proposal.

Present and proposed rates in Tampa and St. Petersburg are as follows:

	Present	Proposed Tampa	Proposed St. Petersburg
One-party business	$9.75	$13.50	$12.50
Two-party business	7.75	11.00	10.25
Four-party business	6.25	8.75	8.25
One-party residence	5.25	7.00	6.50
Two-party residence	4.00	5.35	5.00
Four-party residence	2.95	4.00	3.75

In Sarasota, Clearwater, Lakeland and Bradenton the following rate schedule is proposed.

	Present	Proposed
One-party business	$9.00	$11.50
One-party residence	4.75	6.00

In asking for the higher rates, the company said its payroll costs increased from 7 million dollars in 1953 to $12,500,000 in 1957. It said its employes numbered 3,358 last year and that it spent 113 million dollars building its plant.

In Tampa, the company's operating vice president, Carl D. Brorein Jr., said:

"Our current earnings on the portion of our facilities devoted to intrastate business have dropped to less than 5.5 per cent. We are asking for rates that would give us—as of June 30, 1958—a return of 7.25 per cent."

Mr. Brorein explained that the diminishing-return effect of higher costs is so great that if the requested rates were made effective as late as Nov. 1, for example, the return on the rate base used in the case would be down to 7 per cent.

Mr. Brorein said that of the total gross increase in exchange revenues of approximately 4 million dollars that is being requested, which is less than one-seventh of the company's present total revenue, more than half will be paid out in federal income taxes. The company expects to gain for its own use something less than 2 million dollars, he added.

Company Sells in Illinois

The Illinois Commerce Commission on Aug. 5 authorized the Lomax Telephone Co. to sell all of its properties to the McDonough Telephone Cooperative, Inc. (TELEPHONY, June 14).

Mechanized Oracle Gathers Facts On Bell Communications

A MECHANIZED "oracle" may help Bell Telephone Laboratories predict the desires of future telephone customers.

The oracle is "Sibyl," a computer-like machine and laboratory which can simulate a variety of future communication devices and systems and permit them to be tested without the expense of building special equipment for one-time use. It also will provide objective data on how telephone users would respond to a new service.

Sibyl takes its name from the women of ancient Greece who were supposedly inspired by the god Apollo to see the future. Bell laboratories engineers and psychologists hope to predict from data collected by Sibyl whether a new facility will be useful and attractive from the customer's viewpoint.

Sibyl will help sample those views. A typical test with Sibyl might work this way: A push button telephone would be placed in one of the offices in the laboratories and while the device might look like the real thing it would have no special instrumentation within the shell.

Instead, the test instrument would be linked to Sibyl. When the user operated the instrument, Sibyl would perform the functions of the special switching system such a telephone would require. The push-button information would be translated into conventional dial pulses and be relayed to an operating telephone exchange.

The intervention of Sibyl would not inconvenience the user. While preserving the privacy of the telephone conversations, Sibyl would collect information on how the call was placed—such as the date, time, originator, speed of operation, errors, whether the line was busy or the call completed.

Comparing the information on push-button operation with that from a group using rotary dials would provide a reliable conclusion as to the operational value of the new equipment. The data would also answer questions such as whether certain people are error-prone.

To do all of this, Sibyl relies on three co-ordinated sections. The main machine is similar to a computer and can be programmed to simulate the functions of a proposed service under realistic conditions. Another section includes read-out equipment of conventional design. The third element is an operator console.

The console allows a human operator to be used as an element of simulation. For instance, in a test of "voice dialing"—giving telephone numbers orally to mechanical equipment—a silent operator would listen to the instructions and would do the actual dialing. The user would be "voice dialing" so far as he knew.

The console also displays coded numbers as it collects information; from these numbers the operator can supervise what goes on in the machine.

Bell laboratories engineers hope Sibyl eventually will provide a better understanding of the relationship between machines and people who use them and gradually create a fund of information which will carry over to other projects and reduce the necessity for extensive experimental work on new systems.

Sibyl is the product of studies by the laboratories' Human Factors Engineering Group. The group includes Dr. J. E. Karlin, a psychologist, H. D. Irvin and R. R. Riesz.

REA Appoints R. J. Foreman Deputy Administrator

Appointment of Ralph J. Foreman as deputy administrator of the Rural Electrification Administration was announced on Aug. 19 by the U. S. Department of Agriculture.

Named by REA Administrator David A. Hamil, Mr. Foreman succeeds

high-quality, long-lived
BORING TOOLS
for pole, crossarm, and
timber work . . .

TOOLS FOR CRAFTSMEN
GREENLEE

Whether you need to bore deep or shallow holes, small or large, there is a GREENLEE bit or drill for the job! Various lengths and styles for electric drill or hand-brace use. All of highest quality materials and correct design for easy boring, clean cutting, and long life under hard usage. Stocked by leading telephone supply distributors . . . see yours or write direct for literature.

GREENLEE TOOL CO.
2068 Columbia Avenue, Rockford, Ill.

R. J. FOREMAN

Fred H. Strong who resigned on July 11.

The new deputy joined the agency's staff as a field representative in January 1949 and worked with electric cooperatives in Midwestern and Great Plains States. Subsequently, he was named to positions of increasing responsibility, including section head in the old management division and assistant director and director of the northeast electric area office. He was special assistant for power supply in the office of the administrator at the time of his appointment as deputy.

Before joining REA, from 1946 to 1949, Mr. Foreman was manager of the Southeastern Michigan Rural Electric Cooperative at Adrian, Mich.

The new deputy administrator was born in Homer, Ill., in June 1909. After studying at the University of Illinois, he was employed by the Central Illinois Electric & Gas Co. in the area of Lincoln. Beginning as groundman he was promoted to lineman, serviceman, engineer and district manager. From 1942 to 1945 he served with the U. S. Navy on the West Coast and in the Pacific as chief electrician and chief warrant officer.

PLANT MAN'S NOTEBOOK

Concluded from page 24

local conditions. To a stranger using such an instrument with this instruction card, he probably will not know what numbers he can dial, or what amount he should deposit.

"Good, explicit, instruction cards, in connection with the system of providing free emergency calls, would do much to aid poor old John Q. Public in his encounters with the paystation telephone. It would also do much to raise the prestige of the many telephone companies, both Bell System and Independent, serving the United States."

SECODE
SELECTIVE CONTROL DEVICES
Reports On . . .

DIRECTOR DIAL SYSTEM

One problem long troubling users of point-to-point and mobile radio is achievement of telephone-like communication from a mixed group of radio links operating over a variety of frequency ranges. State police and public safety officials frequently face this problem. Their communication networks, formed from a number of VHF, UHF, microwave, and low frequency links, lack systematized interconnection.

Secode's new Director Dial System overcomes the problem by introducing five digit dial signaling and control. Adding the Secode Director Dial System to existing communication facilities results in an overall network formed from non-physical circuits which acts almost like a telephone system.

HOW IT WORKS

The total communication area is divided into sectors whose size fits the range of mobile units within the sector. Five digit Secode selective signaling is used to contact all fixed or mobile stations in home or alien sectors. For example, suppose car #352 in sector 2 wants to contact car #353 also in sector 2. Car #352 dials 22353. The first two digits, called "director digits," are used to select the sector, lock out calls outside the sector, and actuate the appropriate radio link. The final three numbers energize a signal in car #353.

Similarly, car #252 calling car #454 in sector 6 dials 66454. The first two digits select and control, the last three contact and activate car #454's signal gear. The signal light remains lighted until the call is answered.

ADVANTAGES OF SECODE DIRECTOR DIALING

Secode's new system gives private radio links maximum effectiveness. Only the circuits in use are "busy"—just like a telephone system. All calls are simply and accurately placed. It's just as easy to radio across the state as down the block. For practical purposes, the number of stations on one system is unlimited. The rugged new Secode Director Dial System is economical.

Complete technical information describing Secode's ingenious Director Dial System is yours for the asking. Please address Dept. 738. 2

ELECTRICAL COMMUNICATIONS INC.
Manufacturers of Secode Devices
555 Minnesota St., San Francisco, Market 1-2643

DATA SORTING

THE BELL Telephone Co. of Canada, and Northern Electric Co., have devised an electronic sorter which, they say, is four times faster than any similar machine in the world.

The apparatus is being installed at the headquarters of the Hydro-Electric Power Commission of Ontario to feed its Univac II computer with information.

Into the Bell-Northern sorter will be fed information sent by teletype from Ontario Hydro's area offices. The machine will funnel out the information on a particular subject—meter readings, for example—on a punched tape.

The tape gives the data to the Univac machine which calculates the required information at a fantastic speed of 250,000 characters a second.

Bell Telephone Co. of Canada, which developed the electronic sorter, says it can punch out information on tape at a rate of 3,600 characters per minute.

The sorter will be used to sift out billing information from HEPC's area offices; the Univac machine (itself the first in Canada) will figure out the bills and issue them. The sorter will also handle payrolls, personnel data, stock-control information, engineering problems and accounting and statistical reports.

The system will be in full operation within three months.

BUSY TRUNK COUNTER

A TELEPHONE company traffic department must make a continual study of the extent to which plant equipment is being used. This is necessary in order that the plant may have an adequate, but not an excess number of trunks, switches,

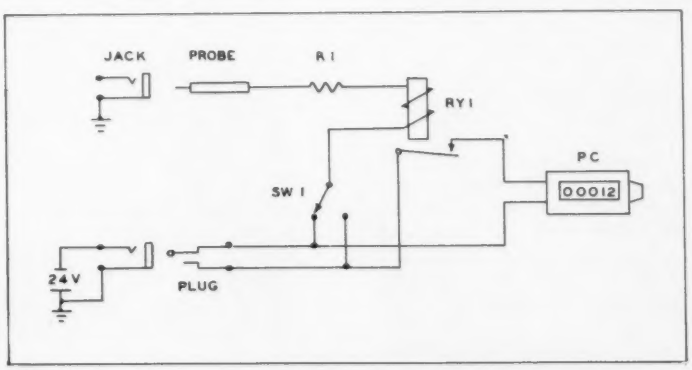
You can build a home-made "Busy Trunk Counter" out of a radio chassis box, a relay, a register and a couple of cords.

or other components. Such surveys sometimes also indicate that the plant could be used to better advantage by regrouping or reassigning certain units.

One method of making such studies is to make continuing checks throughout the day of the equipment actually in use. This is sometimes done by having traffic personnel actually check mechanical equipment and count the number of off-normal switches every few minutes.

A build-it-yourself gadget which makes this job much simpler is shown in the accompanying drawing. It was developed by Mark Karp of Pacific Telephone & Telegraph Co. It consists of a counter with reset knob, a relay, a probe, and a switch. The circuit diagram shown is for use on a 3CL toll switchboard, or at the outgoing trunk test jacks in a mechanical office.

A manual office usually has a battery condition on the sleeve of the jack when a circuit is busy. A dial office usually has a ground. Switch 1 is to take care of this condition; when it is in one position the relay will respond when the probe is grounded, in the other position it will respond when the probe touches battery. The resistance is needed for use on a manual switchboard, where the supervisory light on the cord works over the sleeve. This resistance prevents the probe from



This busy trunk counter can be used at the distributing frame, the switchboard, or the outgoing trunk test panel. The parts used in the original model are: R1-2,000 ohms; RY1-Type 280J relay, 500 ohms; SW1-SPDT toggle switch; PC-24 volt counter with manual reset. (Drawing by Victor Willard.)

lighting a false disconnect lamp or causing the circuit to cut off.

The 24-volt supply jack can be any spare jack in the switchboard to which battery has been connected. If used only in an automatic office, where solid ground is to be found on any busy sleeve, any telephone relay should work. The particular type used in the original model was chosen because it could be made to operate on 1 milliampere of current, which is about all that is available on a busy 3CL switchboard jack.

The counter can be any telephone traffic register. You can get a list of counters as well as other telephone relays and switches at surplus prices from Herbach & Rademan Inc., 1204 Arch St., Philadelphia 7, Pa.

MULTI-CHANNEL INSTRUMENTATION

TELEMETERING systems are arrangements by which various phenomena occurring at a distance can be transmitted by wire or radio to an attended location. This is not new in the telephone business, where unattended automatic offices and repeater stations have long made use of multi-channel instrumentation devices. These transmit back information from the unattended location that includes everything from whether the front door is open or closed, to how much gasoline is left in the tank of the standby motor generator.

The advent of the guided missile and earth satellites has brought great advances in the science of remote indication.

You can bring yourself up to date on some of these techniques by reading a new 16-page booklet entitled "Electronics and Electromechanical Sampling Devices for Multi-Channel Instrumentation." You can get this booklet free of charge by writing on your letterhead to Murray Medvin, General Devices, Inc., P. O. Box 253, Princeton, N. J.

ELECTRONIC EARPHONE

AMONG the noisest places where a telephone has to work are military airplanes and tanks, particularly under combat conditions. The problem of noise reduction under these circumstances has long been a matter of concern to electronic engineers.

The latest development is a new type of earphone developed by the U. S. Army Signal Research and Development Laboratory and Radio Corp. of America engineers. This new earphone includes a well-padded ear piece, but includes a second electronic unit in addition to the regular receiver. The ear-pieces work in conjunction with a special electronic inverter and amplifier unit.

The second unit in the receiver cup consists of a small microphone, which picks up the noise that leaks past the ear-cup. This noise is fed to the amplifier inverter and then is sent back to the ear in equal volume, but opposite phase. This results in the noise signal being cancelled out while the radio signal comes through loud and clear.

Noises which get by the earcups of this new military headset are picked up by a tiny microphone and fed back out of phase, thus cancelling out electrically. (U. S. Army Photograph.)

In combat, the new earphone could be used by artillery men to protect their eardrums, or increase the efficiency of sonar operators by eliminating distracting noises. Civilian use by riveters and mill workers is also foreseen. The phasing out system cuts low-pitched noises down to as little as 1/10th of their original volume. High pitched sounds are trapped by the foam rubber cushion.

NOISE FILTER

AT LEAST a temporary solution to telephone line noise problems is being offered in a device produced by Allison Laboratories, Inc., of La Puente, Cal. Designated as the Model 420P filter, this device consists of an adjustable trap which can be set from 20 to 20,000 cycles.

It is actually a continuously variable filter with separate high pass and low pass sections; thus making it possible to set up a band pass of any width within the above limits. It can be used on temporary circuits where a remote pickup has to be set up. For a broadcast station, for example, adjusting the low end of the filter may assist in eliminating hum and adjusting the high end may eliminate some carrier crosstalk.

Actually in principle, this device eliminates noise by eliminating part of the over-all transmission band width, but it could be quite useful in special applications.

SAY "AH"

THE day may come when you may get your trouble diagnosed by telephone. The Naval Medical Research Institute, Bethesda, Md., has developed a gadget by which such physical conditions as heart-beat, breath sound, and other anatomical functions can be transmitted by radio or telephone.

The system uses the electrical impulses which are normally generated by the body and by converting other conditions such as temperature into

appropriate electrical symbols. The resultant electrical currents are used to modulate an oscillator and the result is then transmitted over radio or telephone circuits. At the receiving end, the signal is converted back into the original form it had in the patient's body. It can then be studied and analyzed just as though the patient were present.

COOL COMPUTERS

ELECTRONIC computers and other equipment must keep cool in order to work efficiently. Indeed, many electronic parts may be destroyed by the heat given off by vacuum tubes.

This matter was the subject of papers presented before the National Heat Transfer Conference in Chicago this month. Although the papers were concerned with airborne electronic systems, the facts apply to electronic equipment everywhere.

The speakers outlined methods by which the temperature of vacuum tubes could be predicted under various cooling conditions. Also discussed was the fact that a transistor, even though it generates much less heat than a vacuum tube, has a much smaller surface available for carrying off the heat. This may cause severe temperature problems. The conference was sponsored by the American Institute of Chemical Engineers and the American Society of Mechanical Engineers.

ELECTRONICS CONFERENCE

THE NATIONAL Electronics Conference, sponsored by engineering societies and universities, will be held at the Hotel Sherman, Chicago, on Oct. 13, 14, and 15, the same dates as the USITA convention. The technical sessions and the commercial exhibits will cover up-to-the-minute information on the broad subject of electronics.

"OJ" CARRIER SYSTEM

A TOLL quality carrier system designed to provide additional circuits up to 500 miles in length on open wire lines was described in a paper presented before the Pacific general meeting of the American Institute of Electrical Engineers. The paper described the "OJ" system, which is so designated because it uses many of the components of the O system, but occupies the type-J field. In the past, type J carrier has been put on important long lines, but type O systems could not be added for any considerable distance to these lines because the frequencies were not compatible. The OJ system can be added and extended over branch lines or can be connected to O systems. Circuits can be dropped or branched in groups of four at any repeater point. Construction of the "OJ" equipment is similar to the N and O systems and requires a minimum of field engineering and installation effort.

Copies of the Transactions Paper, which include a complete description of the system and certain circuit drawings may be obtained from the American Institute of Electrical Engineers, 33 W. 39th St., New York 18, N. Y. The price is 40 cents to members and 80 cents to non-members. Ask for Paper No. 58-1004.

COMPANDOR SYSTEM

THOSE interested in the technicalities of compandor and carrier operation will want to read an article on the Z6NC system, which appears in the first 1958 issue of *Electrical Communication*. This article is a description of a six-channel, two-wire carrier telephone system and is complete with several block diagrams. It was written by three members of the Standard Central Laboratories of Stuttgart, Germany. You get this copy of *Electrical Communication* by writing to H. P. Westman, Editor, International Telephone & Telegraph Corp., 67 Broad St., New York 4, N. Y.

SOLID STATE MASER

THE LATEST idea in amplification and oscillation, the three level solid state Maser, is described in the July issue of the *Bell Laboratories Record*. Maser means "Micro-wave Amplification by Stimulated Emission of Radiation." Mechanically, a Maser consists of a crystal salt placed in a magnetic field in a resonant cavity. The cavity is kept at a very low temperature by refrigeration with liquid helium. The Maser holds promise of becoming a truly low noise microwave amplifier that could be used to improve the performance of microwave systems.

One of the reasons for the Maser's success in the low noise field is the fact that all electrical devices have a certain amount of inherent noise, which is dependent upon the temperature of the parts. This is referred to as thermal noise. The Maser amplifier, because of the extremely low temperature at which it operates, has a very low thermal noise.

Another source of noise in electronic devices is that called "shot noise," which arises from the motion of free conducting electrons. The Maser avoids noise from this force because it does not use free electrons for its operation. Instead the Maser operates by bringing about changes in energy levels of atomic "spins."

In addition, unlike the usual amplifier, the Maser does not draw its power from a dc power supply. Instead microwave energy at a frequency higher than the signal is used as a source of energy. The microwave power used is called the pumping frequency. In a typical application, a pumping frequency of

17,500 megacycles was used with an output frequency of 9,000 megacycles.

Another peculiarity of the Maser amplifier is that it is a two-way device; it will amplify in both directions. This is actually a handicap because it means that any reflection from the output end of the circuit will be amplified and tend to make the Maser oscillate.

TESTING THE TESTERS

PROBABLY every telephone company has, or should have, an instrument for testing for the presence of gas in manholes and other locations. Whether such a tester is always in working condition or not may be a matter of doubt, so a device has been developed for testing the tester.

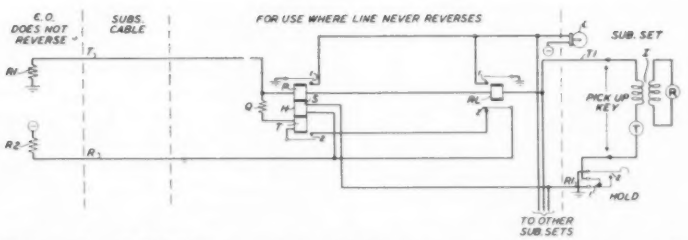
In use an ampoule of methane is broken inside of a plastic squeeze bottle and the methane-air mixture is squirted into the testing equipment. If the tester is working, it will show the presence of this gas. You can get information on gas sniffers and testing kits from the Johnson-Williams Co., 2639 Park Blvd., Palo Alto, Cal.

RELAY BULLETIN

A NEW engineering bulletin covering multi-contact relays has been prepared by the Phillips Control Corp. of Joliet, Illinois. It includes complete technical data of relays used in switching circuits in industrial controls. You can get a copy of this bulletin by writing for it.

CAPACITORS

A FOUR-PAGE bulletin describing GE's low voltage tantalytic capacitors is available. These unique condensers have seen wide use in telephone carrier applications. You can get a copy of the bulletin by writing to General Electric Co., Irmo, S. C.



Patent No. 2,810,016 is a key telephone circuit which requires only three wires between subsets.

HOLDING CIRCUIT

KEY telephone sets of present design have required at least a five-wire cable for installation on account of the signal lights and holding keys. A recently issued patent, No. 2,810,016, offers a new design for pickup and hold that uses only three wires between the subset and the relay box located on the premises. In the accompanying drawing it will be seen that when the telephone is in use, battery from the central office will flow through the secondary winding of Relay H, the transmitter, the induction coil, the winding of relay RL, and the primary of relay H. This will cause relay RL to operate lighting a lamp to show that the line is in use. Relay H will not operate because the primary and secondary are wound in opposition and the equal current in both cancels out.

To put the line in hold condition, the hold key is depressed, which puts a ground on the ring side of the line through the secondary winding of relay H. The pickup key is released at the same time, which breaks the current going through the primary of Relay H and Relay RL. Relay RL will release, but relay H will operate on the secondary alone because the primary is no longer energized to cancel it out. The operation of relay H will keep the lamp lighted over its upper contact. The bottom contact of relay H closes a locking path, which puts the tertiary winding across the line, which continues the hold condition after the key is released.

When the pickup key is again depressed relay RL will reoperate, breaking the locking path and dropping the H relay. The patent was issued to Gale L. Knittle and assigned to American Telephone & Telegraph Co.

CARRIER RINGING

ONE of the problems in subscriber line carrier is that of regenerating the energy to ring the telephone bell at the far end. Present-day telephone ringers require relatively high power and low frequency, which cannot be transmitted through a carrier system. To use a present-day telephone subset on a subscriber line carrier requires some sort of a machine at the subscriber-end which will produce the 20-cycle power necessary to ring the bell.

One approach to this is the use of a horn-type transducer in the telephone, which will emit a tone instead of a ring. This transducer, which is called a "Telecaller," is sufficiently sensitive to produce a tone of loud volume when energized by an audio tone, which has been transmitted through a carrier. Telephones of this sort would work well with an electronic switching central office where the correct tones were supplied by the office. However, to apply the "Telecaller" subsets to an

existing central office, requires a special arrangement.

Such an arrangement is covered in a Patent No. 2,808,464, which has been issued to Lawrence A. Webber and assigned to Bell Telephone Laboratories. This patent covers the use of a so-called "Telecaller" generator, which would be placed ahead of the carrier transmission equipment in the central office. This generator would accept the present ringing from the central office, tip or ring, polarized or otherwise, and regenerate from it a distinctive tone, which would cause the correct subset on the line to respond. The telephones would have selective filters, so that each would respond to a single tone only.

This system would permit the present ringing system in the office, including the party line arrangements, to remain intact in order to serve the non-carrier telephones; but would permit "Telecaller" operation on lines which had subscriber line carrier. You can get a copy of this patent which shows the circuits involved by writing to the Commissioner of Patents, Washington 25, D. C., and enclosing 25 cents.

CERAMIC TUBES

CERAMIC tubes which will operate at 700° C have been developed by the General Electric Co. The tubes are made to operate at an ambient temperature which is this high so, therefore, a heater is not necessary in order to cause electron emission. Because of this the size of the tubes is little larger than that of a shirt button.

GERMANIUM THERMOMETER

A THERMOMETER for measuring temperatures in outer space has been developed by the Bell laboratories. It consists of a tiny crystal of arsenic-doped germanium. Temperature can be determined by reading the resistance of the crystal, which gets higher as it gets colder.

METERS

IF YOU are interested in instrumentation, you will want to get on the mailing list of a new eight-page quarterly technical bulletin called "Meters." Write to Richard Hess, Industrial Products Division, International Telephone and Telegraph Corporation, 250 Garibaldi Avenue, Lodi, N. J.

How To Get Your Money's Worth From Electronic Equipment!

THE TELEPHONE industry is rapidly taking advantage of new developments in electronics. This is only natural. Since the telephone first came into existence, telephone men have been quick to recognize the value of new developments.

Thus it is not surprising that the industry is using more and more electronic equipment. Mobile radio is used to connect telephones in cars, trucks and other vehicles. Microwave relay links are used in place of wire and cable in many places. Electronic carrier

Carl E. Smith, E. E., President
Cleveland Institute of
Radio Electronics

circuits and repeaters result in better utilization of existing (and proposed) facilities.

All of these improvements are available today. Tomorrow will see even greater advances. The manufacturers of telephone equipment can be relied upon to give you the kind of equipment you need to fulfill your obligations to your subscribers.

However, you should keep in mind a fundamental principle of management . . . a chain is only as strong as its weakest link. Thus, no matter how big or small you may be, your equipment will not give maximum performance unless it is maintained by competent technicians.

Every company has a technical staff. It may consist of hundreds or perhaps thousands of men . . . or there may be only two or three. These men know and understand telephone technology as it used to be, but in all honesty, do they understand the fundamentals of electronic circuitry?

If they aren't on speaking terms with oscillators . . . rectifiers . . . amplifiers . . . transistors . . . etc., they are not going to be able to give you the technical support you need. A man may be able to wire a central office switchboard in the dark, but if he isn't skilled in the mental tools of electronics, your new equipment will not give you the service you paid for.

In all probability your present staff is very capable. You wouldn't have one which didn't give you the reliability you must have. Therefore they are the logical men to take on the maintenance of electronic equipment . . . as soon as they have received a sound foundation of electronic fundamentals.

This can be done economically and without the loss of valuable man hours by a non-resident training program. Several schools offer this service. They teach your men the fundamentals of electronic circuits. Then, with the ability to understand the principles of any electronic device, your company and the equipment manufacturer have only to conduct a brief orientation of the specialized equipment.

This plan has been used successfully by many companies. It has helped them . . . and it can help you. It will pay you to investigate and get the facts.

For full information on schools providing training in electronic theory and FCC license preparation, write to the National Home Study Council, 1420 New York Avenue, N. W., Washington 5, D. C.

If you would like the details on a "guaranteed" Employers Plan for training technical personnel, write to

THE REGISTRAR
CLEVELAND INSTITUTE OF
RADIO ELECTRONICS
4900 EUCLID AVENUE, DESK TE-22
CLEVELAND 3, OHIO

NEW...

midget pliers added to KLEIN line

Hardly larger than a package of your favorite cigarettes, these new Klein Midget Pliers will simplify many of those small jobs where space is confined.

Midgets in size but giants in performance, they solve major problems when wiring up electronic assemblies; making model trains, airplanes, automobiles, or in any extremely small or confined work.

These new midgets are additions to the famous Klein line of high-quality pliers that are backed by over a century of manufacturing experience. See your dealer.

No. 257-4 Oblique Cutting Plier	**Size 4 in.**
321-4½ Long Nose Plier	**4½ in.**
322-4½ (Without Knurl)	**4½ in.**
224-4½ End Cutting Plier	**4½ in.**

Free Bulletin on Klein Pliers

Bulletin 758 lists the many various pliers in the Klein line. A copy is yours for the asking. Write for it today.

Mathias KLEIN & Sons
Established 1857 — Chicago Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

Helpful Literature

BATTERIES—C & D Batteries, Inc., has released a new 14-page bulletin, T-532. It covers the use, design and construction of the firm's premium line of PlastiCal® lead-calcium grid communication batteries.

The bulletin includes complete cell data on the entire line from 50 to 1,680 ampere hour ratings, curves on discharge characteristics, rack data, accessory details, and a complete listing of the company's sales and service offices. Request HL434.

•

POLE LINE HARDWARE—The Pole Hardware Division of Malleable Iron Fittings Co. announces a new 12-page catalog of pole line hardware for the telephone industry. The book describes the complete line of MIF hooks, guy and cable clamps, etc.

Among the featured items are rural cable clamps for heavy and light duty, guy hooks designed to place the through-bolt in tension, universal guy clamps with the "come along" grip that increases as the load increases, cable suspension clamps with large area pads and spurs to resist vertical movement, universal angle spar connectors designed to reduce push brace erection costs.

Specifications, installation data and price information are included. Request HL435.

•

BATTERIES—A new 12-page reference and specification catalog titled "Gould Calcium Stationary Batteries for Full Float Applications" has been issued by the Industrial Division of Gould-National Batteries. Designed to help industrial battery users, the catalog discusses suggested uses, proper installation procedures and development of the Calcium stationary battery.

Featured in the catalog is a step-by-step procedure for calculating all size requirements with the new battery. Engineering specifications tabulated include ampere hour capacity, discharge rates, overall cell dimensions, weight per cell and electrolyte required.

In addition to illustrating the various properties of the new Plastrite Jar, an exploded view of the Calcium cell shows battery components and new design features. Request HL436.

•

ELECTRIC PLANTS—An illustrated four-page folder recently offered by D. W. Onan & Sons Inc., Minneapolis, Minnesota, tells what should be considered in selecting an electric generating plant and shows on-the-job pictures of these products at work.

When choosing an Onan Electric Plant (the folder states) consider maximum use of electric power tools. The more power tools used, the lower costs will be.

Size of the work crew is an important consideration in choosing the capacity of the generating set needed. The folder lists these as minimum requirements:

One or two-men crews . . . a minimum of 1,500 watts.

Two or three-men crews . . . a minimum of 2,000 to 2,500 watts.

Four or five-men crews . . . a minimum of 3,500 to 5,000 watts.

On project building sites . . . a "central" source of electric power for many crews . . . a minimum of 7,500 to 10,000 watts or more.

Catalog-style information describing

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation further information on the products described in the following numbers:

HL434_____; HL435_____; HL436_____; HL437_____;

HL438_____; HL439_____.

Name.....Title.....

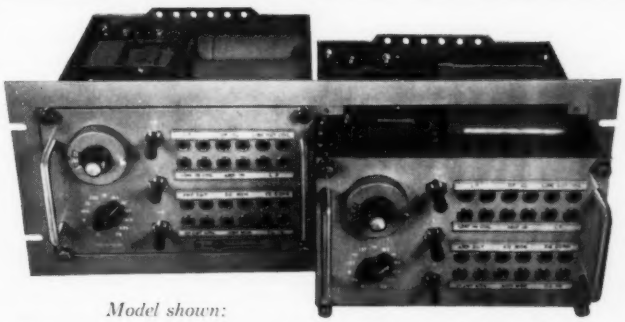
Company.....

Street.....

Town and State.....

8/30/58

Airtronics Packaged Program Equalizer reduces line-up manhour costs as much as 75%



Model shown:
Twin-unit for rack mounting. Also available in single-unit models.

Try it FREE for 30 days. If it doesn't save you its purchase price, return without obligation.

Now, for the first time, here is a self-contained, packaged program equalizer. One that is specifically designed for operation on standard program-loaded or non-loaded communications cables and open wire, but may be applied advantageously to a variety of other circuits.

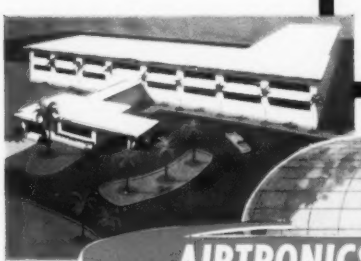
The Airtronics Program Equalizer has pre-tuned circuits in 1½ KC steps from 5 KC to 25 KC. You make all adjustments instantaneously by simple switch settings to desired frequency. Accurate equalization is achieved in minimum line-up time. A task now done in minutes which heretofore has been a tedious, time-consuming job for two skilled men.

Used with sweep generator techniques equalizing costs go down, down, down. Just three or four applications can save enough manhours to cover its modest price.

YOU BE THE JUDGE—Take advantage of our free-trial offer to test Airtronics Program Equalizer performance in your plant. A simple request on your business letterhead, specifying whether you want to try either the single or twin-mounted unit, is all that's needed.*

We'll send you the Airtronics Program Equalizer together with operating manual and complete pricing. Try it in actual use for 30 days. Then if you are not fully satisfied with its performance or convinced that it will save its purchase price many times over, just return the instrument without cost or obligation. Write today.

AIRTRONICS PROGRAM EQUALIZERS *are available in portable, wall mounting, or standard 19" or 23" rack-mounting arrangements. Rack mounting provides test and monitoring jack features. Special purpose equalizers available on order.*



**Note: We reserve the right to limit this offer to operating telephone companies only*

A PRODUCT OF

AIRTRONICS INTERNATIONAL CORPORATION

P.O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

two distinct types of Onan electric plants—*highly portable* gasoline models and *high capacity* models (both gasoline and Diesel)—gives details on wattage, voltage and engine-generator characteristics of the Onan line of air-cooled generating equipment.

Specifications and optional accessories for each model from 500 to 10,000 watts are given. Request HL437.

•

TEACHING SHUT-IN STUDENTS—Teachers, school administrators and physicians, as well as parents, concerned with the education and welfare of boys and girls confined to their homes or to hospitals because of illness will find much useful information in a new 24-page handbook by J. A. Richards, director of the special education division of Executone, Inc.

Titled "How to Teach Shut-In Students by Telephone," the booklet contains practical suggestions for dealing successfully with many of the educational problems of homebound and hospitalized children. The material is the result of a study of hundreds of cases in which application of a home-to-school telephone device proved of great benefit not only in enhancing educational progress but in heightening morale of immobilized children and in speeding recovery.

The nationwide survey, on which this handbook is based, was conducted with the supervision and assistance of an advisory committee of authorities in school administration, special education and rehabilitation. The final manuscript was edited by members of this committee whose names are listed on the back cover.

Dr. George B. Brain, superintendent of schools of Bellevue, Wash., in his introduction, states that the home-school telephone system provides "a major scholastic and social benefit for the homebound child" because "it makes him aware that his progress is in accord with that of the children in the regular classroom situation."

Equally valuable, according to Dr. Brain, is its function in providing the child with "daily contact with the real world of the school" which permits him to develop an understanding of the activities which are being enjoyed by other children the same age."

But, as it is frequently stressed in the Handbook, the telephone-to-home system, with all its potential value, must be accompanied by proper procedures. Any educational device is only as good as the use to which it is put. And in this connection, the human element becomes the critical factor.

The handbook describes how the home teacher, class teacher, school administrator, parents and (if the child is hospitalized) the hospital administrator, are intimately involved in the process of educating a shut-in child. Moreover, the cooperation of the child himself must be obtained. For this reason, one section of the booklet is addressed to the shut-in himself, explaining in clear, simple terms how he can cooperate in the best use of the facilities provided for him.

Six other sections are also each addressed primarily to a human link in the chain that connects the shut-in child to the classroom. They detail the best methods of utilizing the system by the school administrator, special educators (including guidance directors and principals); class teacher, home teacher, physician, parents and hospital administrators.

With proper utilization of the suggested techniques, disabled students often make outstanding progress—in some cases excelling their normal scholastic records. In addition to technical data, the pamphlet explains the minimum physical and mental requirements of children who may benefit from the system and provides data on educational effectiveness and psychological values of the telephone teaching service. Cost information on equipment, which

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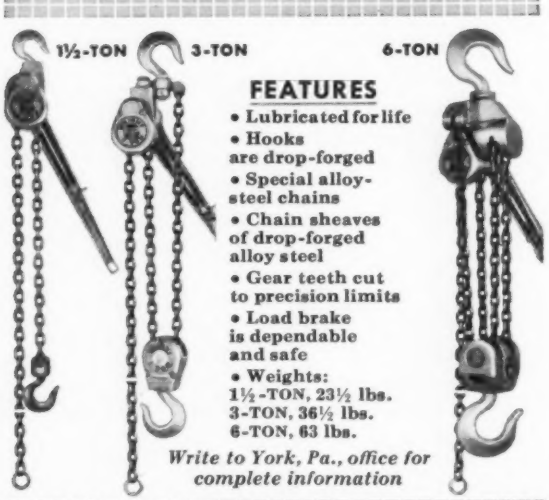

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A Directory for the Nelson Telephone Cooperative

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is provided on a rental basis by Bell System and Independent telephone companies, is also provided. Request HL438.

•

PAYSTATIONS—"How to make paystations pay in your area," plus case histories of 10 profitable paystation installations, are featured in Automatic Electric Co.'s new paystation catalog, now ready for distribution.

Products listed in the 16-page catalog include the company's complete line of Types 80 and 90 paystation instruments (available in 10 colors and in black) in standard burglar-resistant housings; a full line of paystation accessories; and booths and signs. Also included are descriptions of the four kinds of coin telephone service—prepay, semi-postpay and the new local prepay—in which these instruments can be used.

On the inside front cover, "America on the Move" discusses the increasing demand for paystation service throughout the nation.

To help customers make paystations pay in their areas, a number of tips have been gathered from operating companies with records of profitable paystation operation.

The locations of 10 selected paystations, their average monthly revenue and the identity of the operating companies owning them are included in the case histories. Request HL439.

Cross With Care

In the U. S. in 1957, there were over 370 persons killed while crossing at an intersection with signal. Remember, cross cautiously.

USITA Convention Data

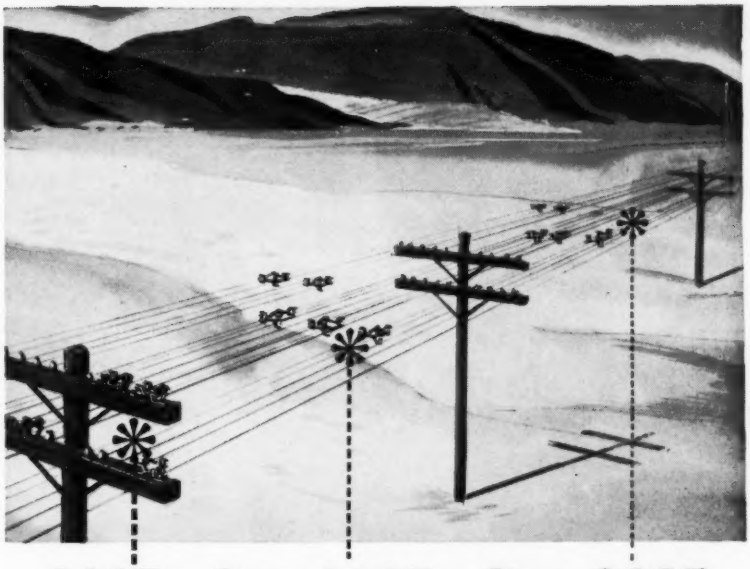
TIME: Oct. 12, 13, 14, and 15.

PLACE: Conrad Hilton Hotel, Chicago, Ill.

PROGRAM: General sessions; departmental conferences (REA borrowers' meeting, 2 p.m., Oct. 12); manufacturer's exhibits; annual banquet and dance; annual meeting of Independent Telephone Pioneer Association.

SPEAKERS: USITA and industry representatives and nationally known figures.

NOTE: There will be no convention registration fee. Advance registration forms may be obtained by writing the United States Independent Telephone Association, 430 Pennsylvania Building, Washington 4, D. C.



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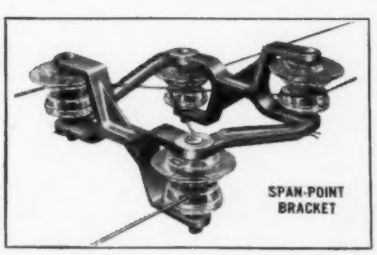

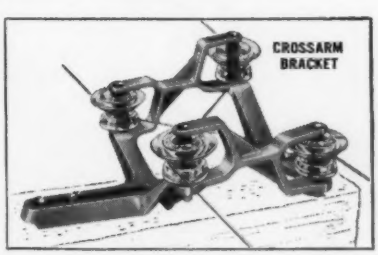

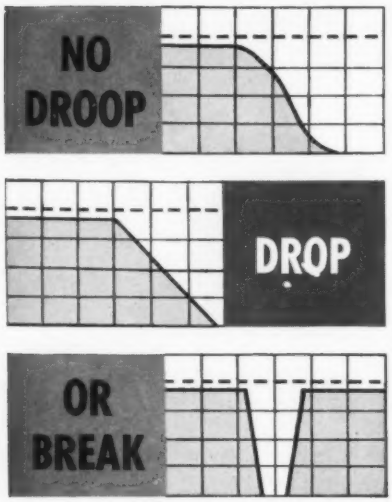

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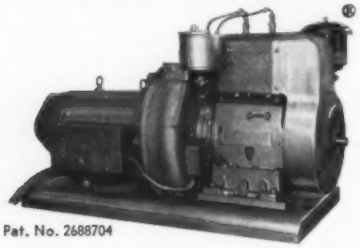

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H. C. Ryon Rejoins North Electric Co.

William Tucker, chairman of the board and president of North Electric Co., Galion, O., announces several executive appointments as part of North Electric's reorganization program to strengthen the competitive position of the company.

H. C. Ryon was elected by the board of directors to the position of vice president in charge of the telephone division, effective Sept. 2.

H. C. RYON

Mr. Ryon resigned as sales promotion manager of Automatic Electric Co., Northlake, Ill., the main manufacturing subsidiary of General Telephone Corp., to head up the reorganized and expanded telephone division of the 75-year-old North Electric organization.

He was associated with North Electric from 1931 to 1952, the last 10 years of which he served as sales manager. Joining Automatic Electric in January 1952, as staff engineer, he was appointed one year later to the position of sales promotion manager, a title held until his resignation. In this capacity, he was responsible for coordinating the sales promotional efforts of the entire Automatic Electric oragnization, as well as setting up a new marketing research division in January 1957.

Mr. Ryon, an industry veteran of 27 years, is widely known throughout the telephone field.

In announcing the appointment, Mr. Tucker asserted that "the addition of Mr. Ryon to our top management team is another step toward strengthening the executive group that will keep North in the position of pre-eminence it has enjoyed since 1884."

E. W. Gray, telephone division manager, has been promoted to administrative officer of the company by Mr.

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NOT *literally*, of course, but they are engaged in so many electronic activities associated with the vast air world above us that they might well be broadly identified as "space men."

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Other ITT "space men" are making important contributions to air reconnaissance, inertial navigation, infrared, missile guidance and control, electronic countermeasures, radio communications, radar, scatter communications, and other categories vital to national defense.

These are only a few of the many activities at ITT laboratory and production centers – coast to coast – where challenging problems are constantly opening the way to top careers.

To learn more about the opportunities at one of America's great and growing electronic enterprises, write to ITT Technical Placement Office, 67 Broad Street, New York 4, New York.

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Tucker, and is responsible for many of the duties formerly performed by H. Y. Kraepelien, recently resigned from the office of president of the company.

At the same time, Mr. Tucker announced the appointment of Rear Admiral Fritz Gleim, USN (Ret.), to the

REAR ADM. FRITZ GLEIM

position of assistant to the president. A graduate of the United States Naval Academy at Annapolis, Admiral Gleim completed electronic engineering studies for his master's degree at the University of California at Berkeley.

His war record began when the first bombs fell on Pearl Harbor where "For Heroic Achievement as Damage Control Officer . . ." he was awarded a Gold Star in lieu of the Second Bronze Star Medal with Combat "V". The citation states that he courageously

R. B. NOTTINGHAM

led his damage control parties below deck into darkened compartments flooded with water and oil, and, despite danger of the Raleigh's capsizing, directed his men to effect necessary repairs, and was thereby responsible

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- easier to handle
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Not only does your wire arrive in perfect condition, but the sturdy carton protects it all the while it's in your warehouse.

The cartons are easier to handle than loose coils. They can be stacked higher without danger of falling and the wire on the bottom will not be crushed or bent. Space is saved, inventory taking is simplified, and the possibility of injuries to workers from tumbling coils is removed.

We try to make Alphaduct the finest, longest lasting drop wire money can buy. Quality materials are used throughout, step-testing during every phase of manufacture assures uniform high standards. Alphaduct drop wire is dated with a color coded thread so you can tell for sure how long it lasts.

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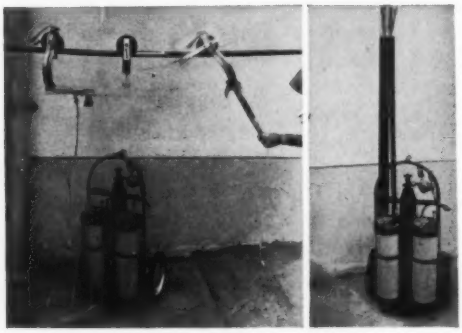

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Wheel—nylon bearings, self-lubricating

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Both models use highly successful chemical type leak detector. Applicator's dual nozzle sprays both sides of pressurized cable, giving 100% coverage. Bubble cluster forms around leak within minutes and can be clearly seen from the ground. Air pressure bottle in cart supplies regulated pressure in solution tank at all times, can be adjusted for different heights.

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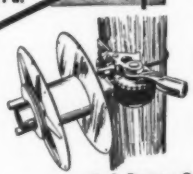
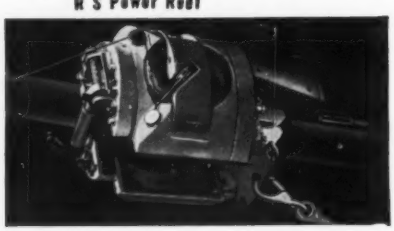
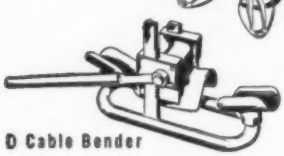


R S Power Reel

C R Power Reel





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in large measure for keeping his ship afloat. In addition, he earned five other decorations for meritorious service under combat in both theaters of war. During his 30 years of naval service he served in many outstanding capacities, including commanding officer of many ships, in many oceans, and was division or squadron commander during several different assignments.

Admiral Gleim's long association with naval communications culminated in a tour of duty as commanding officer of Naval Communications Station, Norfolk, Va., and Fifth Naval District communications officer. He also served in the office of the Secretary of Defense as a senior member of a Board of Review working with American industry. He recently retired from the Navy as chief of staff of the Fifth Naval District.

The appointment of Ralph B. Nottingham as director of quality control was also announced by the North Electric chairman. Mr. Nottingham is a graduate of Wayne University, where he earned both his bachelor's and master's degrees. He was retained as an instructor at Wayne University upon completion of his studies. Additional work for his Ph.D. was continued at Columbia University.

In 1945, after three years as an ordnance engineer, Naval Ordnance Laboratory, Washington, D. C., Mr. Nottingham joined the Brush Development Co., Cleveland, O. Successively important positions were held with this firm, including manager, special products department; manager of customer service department, and training director.

In 1952, Mr. Nottingham was appointed manager, quality control department, Brush Electronics Division, Clevite Corp. Since that time until his resignation, he has held an executive position with the Cleveland firm in the highly specialized field of quality control. Mr. Nottingham brings to North Electric administrative and technical experience necessary for the critical nature of current production for missile projects as well as advanced and specialized communications and electronic systems development and production. He is the author and co-author of several important articles in the field of quality control, and is a senior member, American Society for Quality Control.

IT&T, Ericsson Sell Interest In Telefonos de Mexico

Final steps in the sale of 75 per cent of the stock of Telefonos de Mexico to Mexican interests by International Telephone & Telegraph Corp. and Teleric Inc., a subsidiary of L. M.

PRESSURIZED CABLE SYSTEMS

The need for an automatic device to stand guard at intervals along pressurized cables has long been recognized. Now United Electric Controls has the answer . . . The Telephone Cable PRESSURE-GUARD.

Developed by U.E., in collaboration with the Bell System, the PRESSURE-GUARD is now available to all Telephone Companies as an aid in reducing cable maintenance costs.

In the past the location of a cable leak was a matter of man hours in climbing poles and manually checking pressure points. When the pressure guard detects a pressure drop it introduces an electrical resistance . . . which indicates at a central monitoring source a cable leak and the location.

Specifications Pressure-Guard

Field Adjustment Range	0 to 15 PSI
Factory Setting	2 ±¼ PSI on falling pressure
Pressure Response	4 ±½ oz.
Proof Pressure	30 PSI
Electric Rating	0.01 amp 110V DC
Load Resistor	Carbon composition 330,000 OHM 1 watt
Take-Off Tube	Tinned Copper 6′ x ¼″ x 0.035
Drop Wire	6′ Type SJ0 #18 stranded 0.2 conductor
Size	6″ x 4½″ x 2½″
Approximate Weight	1¾ lbs.

These specifications may be modified in a great variety of ways to meet the requirements of any given application.

UNITED ELECTRIC *manufactures a complete line of temperature, pressure, and vacuum controls. For applications requiring custom-built units or modified standard units, call upon a UE application engineer for recommendations. Write for complete specification and pricing data on the Telephone Cable Pressure-Guard. Similar data available on all other UE controls.*

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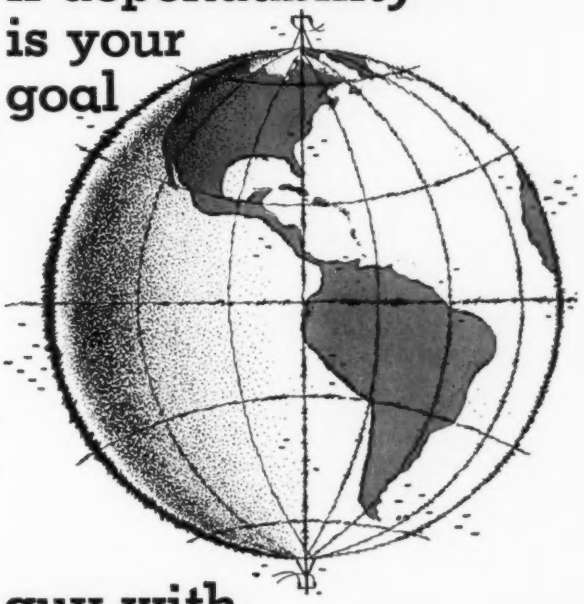
from pole to pole... if dependability is your goal



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Service conditions demand that guy, messenger and overhead ground wire possess the strength, ductility and corrosion resistance that will assure safe installation and long trouble-free service life.

To meet these requirements, CF&I makes steel that has exactly the right chemical and physical properties. It draws, galvanizes and strands the steel wires into a product that will give years of satisfactory service. Extreme care in cleaning and galvanizing produces a tightly bonded coating of pure zinc that provides maximum protection against corrosion.

CF&I Galvanized Steel Strand meets or exceeds ASTM Specifications A-122 or A-363. If you prefer, it can be made to your specifications in seven- or three-wire constructions. Your nearby CF&I representative or local electrical distributor will give you complete details. Why not call him today?

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THE COLORADO FUEL AND IRON CORPORATION

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COMMUNICATIONS UNIT Model M

- For Inter-com Use
- Saves Time & Money
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Unit enables point of work communication in checking and aligning exchange equipment. Transistor powered amplifier with combination transmitter-speaker, batteries and switching. Output + 3 D B into line. — 12 D B from line provides sound output which can be heard from 20 to 30 feet. Units may be operated through carrier equipment.

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- SAFER
- LONGER LIFE
- LIGHT WEIGHT

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SPITZER BLDG., TOLEDO 4, OHIO

Ericsson Co. of Sweden, were taken on Aug. 21, it was reported.

The Mexican group is headed by Eloy Vallina, president of Banco Commercial Mexicano, and Carlos Trouyet, head of the investment company bearing his name. The company is now under 100 per cent Mexican control.

Copperweld to Install New Alumoweld Equipment

Copperweld Steel Co. has approved an appropriation of $1,325,000 for installation of new plant facilities at Glassport, Pa., to meet a rising demand for its new Alumoweld wire and strand.

A limited production of Alumoweld commenced a few months ago following several years of extensive research and development. Alumoweld is unique because it represents a successful application of a thick cladding of aluminum to steel by an "atomic" weld, according to William W. Ege, vice president in charge of the wire and cable division.

The process utilizes heat and pressure to weld the aluminum to the steel, and subsequently the bimetallic rod is drawn into wire. The new product is composed of 25 per cent aluminum by area as compared to much smaller percentages for aluminum covered steel wire made by other methods. Alumoweld retains its firm weld and one-metal quality when drawn into wire, it is said.

Better corrosion resistance, better conductivity, lighter weight and permanent high strength are claimed to be Alumoweld's advantages. Because of these qualities, the company states, it is good for power conductors, overhead ground wires, core wires in ACSR (aluminum conductors, steel-reinforced) and for guy and messenger strand.

The Work of Government

". . . the only durable hope of ever lightening the total burden of government must come from a constant and insistent public demand that any government waste and inefficiency be driven out, and that the true job of government is to defend and to govern the nation—and very little else, let alone to engage in an incentive-destroying redistribution of the people's income. There should, instead, be a release of productive incentives so that real income may grow rapidly and thus relatively lighten the tax burden."—ROBERT C. TYSON, *chairman, finance committee, United States Steel Corp.*

The Real Deceiver

"Who has deceived thee so often as thyself?"—FRANKLIN.

Automatic Electric Co. was the scene of the Aug. 5-6 meeting of the DDD subcommittee of United States Independent Telephone Associations' Engineering Committee. Responsible for coordinating with the Bell System on all problems relating to distance dialing, the subcommittee met to discuss a number of questions pertaining to Direct Distance Dialing (DDD) and operator distance dialing which had been submitted by Independent operating companies and their equipment suppliers. The minutes of the meeting will be distributed throughout the entire telephone industry. Sub-committee members attending the meeting were, clockwise around the table: C. M. Davis, general equipment engineer, General Telephone Co. of California; Harry Disston, assistant staff coordinator, Bell-Independent relations, AT&T; J. P. Ringland, traffic planning engineer, AT&T; Harry Barrows, division equipment engineer, California Water & Telephone Co.; Sub-committee Director Leonard L. Ruggles, chief telephone engineer, Automatic Electric Co.; Oscar Myers, systems planning engineer, Bell Telephone Laboratories; H. E. Weppler, toll planning engineer, AT&T; Meynard S. Knapp, central office equipment engineer, Rural Electrification Administration (Mr. Knapp is not a sub-committee member, but attended the meeting as an observer); Marcus L. Donaldson, chief engineer, General Telephone Co. of Fla. Herman Kleinhammer, general traffic manager, Inter-Mountain Telephone Co., Bristol, Tenn., was unable to attend the meeting.

BURIED WIRE AND CABLE

Continued from page 21

this reason, a six-pair terminal was developed from readily available piece parts using a six-pair connecting block mounted in a 10-pair terminal housing. The cable was terminated "IN" and "OUT" on the connecting block. No effort was made to protect the core or terminations from atmospheric humidity. The present "ready-access" terminals are descendents of the above terminal. Experience with this terminal has proved that quite often it is more economical to terminate "IN" and "OUT" than to make a splice.

The records of the Michigan Bell indicate that maintenance costs on buried PIC cable have been unbelievably low. In fact, during 1954, no troubles were reported on any buried exchange PIC cable. Their experience with maintenance on buried cable has been such that the annual charge is somewhat less than 3 per cent. The comparable figure for aerial cable is about 8 per cent. The service effecting sheath-breaks during 1957 in Michigan per 100 sheath miles on non-pressurized cable were: Buried 16.52, underground 17.18, aerial 69.64. The experience with maintenance on buried wire has been such that they calculate this annual charge at 6.28 per year. The comparable figure for aerial wire is 12.29 per cent.

Michigan Bell's single circuit cost for buried wire in 1957 was $623 per mile. Two pair, including shield wire, was $1,015 per mile. This compares to one pair of open wire, 12 poles and three anchor guys at $850, and two-pair at $1,075 per mile. The average placement cost for 407,711 sheath feet of buried cable was 4.88 cents per sheath foot. This is approximately equal to the material cost for 6M strand. From this observation it is obvious that it proves practicable to consider buried construction even though there may be an existing pole line. The average placement cost for 520,355 trench feet of buried wire was 3.39 cents per trench foot.

A standard line construction truck is not designed to act as a prime mover. As mentioned previously, Michigan Bell has quite often used the W-16 plow to place small cable and buried wire. Additional maintenance and repairs on these trucks in 1954 averaged about $3.50 per mile of buried plant. In 1955, special axles were installed in six line trucks which are used as prime movers. Data are not available as to how effective these axles were in reducing mechanical failures when the vehicles are used to pull the W-16 plow. On jobs

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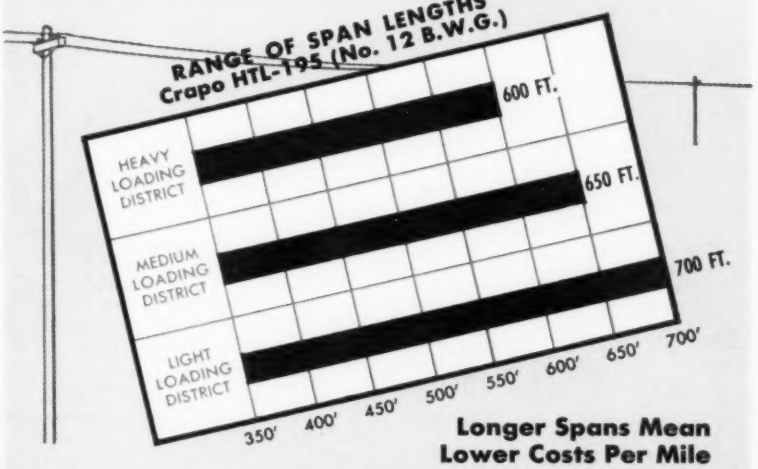
HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The NEW LOWER Resistance Extra-High Tensile Line Wire



Longer Spans Mean Lower Costs Per Mile

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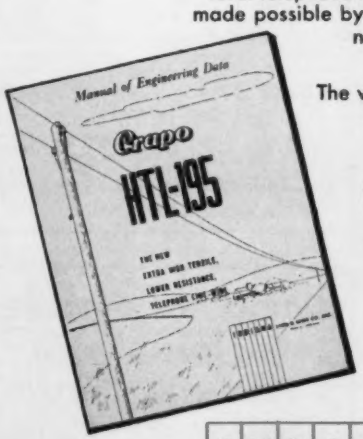

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handled by contract, McCormick Farmall 450 Tractor, and Allis Chalmers HD-11 Tractors were used. These tractors were both equipped with a wire and cable plow of the contractor's own design.

In summary, Michigan Bell has determined that we are on the threshold of a greatly expanded use of buried facilities, both urban and rural. They have learned that rural buried construction is both practical and economical in Michigan. Furthermore, they are confident that urban buried construction will also prove, in a great many instances, to be both practical and economical.

As we stated in the beginning of this article, we do not intend to recommend that buried wire and cable will or should replace all aerial lines. We have attempted to furnish the general requirements for buried facilities and then to report the experiences to date of several operating companies in various sections of the country with this type of plant. It is quite obvious that soil conditions and terrain in certain areas are better adapted to this type of construction than others. It is our hope that when planning the construction of new plant the information contained in this article may prove of some assistance to telephone companies in making a decision as to what type facility will best suit their particular requirement.

(The End)

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Many communities have availed themselves of the reliability, simplicity and low maintenance of the Kellogg Volunteer-Fire-Call System. It's the surest, fastest way to alert volunteers to any emergency. Your nearby Kellogg sales representative will be glad to explain the many advantages of this system for your community.

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2—Automatically rings up to 10 firemen from originating call

3—Identifying—continuous ring

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6—Reliability proved by years of continuous service

7—No special servicing

8—Easy wall mounting—40" x 18" x 10¼"

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